DECEMBER, 1956

Commercial Fertilizer

and PLANT FOOD INDUSTRY

RADICAL PROPOSALS IN MODEL FERTILIZER LAW

See Page 19

Are you good at figures?
EXAMPLE 1
Valve Bags for Granular or Pulverized Materials
If you increased filling production from 12 per minute to 15 or more per minute—without paying a penny more for sleeve or special insert bags... what would be the percentage of increase—and dollar savings to you—per ton—per hour?
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- ☐ We are interested in Example 2.
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and PLANT FOOD INDUSTRY

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Contents

New Horizons in Chemical Industry, by *Marlin G. Geiger* 14
Factors in Determining Profitable Fertilization Rates by *Arthur B. Mackie* and *Earl O. Heady* 25
The Soil Bank, What It means to the Industry 26
Ammonia Group Sees More Stable Future 36
Southern Soil Fertility Group Formed 42
CFA Meeting Report 50
Pictures from Middle West Soil Meeting 53
Around the Map 55
Personals 57
Obituaries 60
McCollum Heads Pacific Northwest Association 62
Fertilizers Revive Worn-Out Soils 64
Safety 67
Tonnage Reports & Markets 68
Industry Calendar 68
Classified Advertising 70
Advertising Index 72

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Commenting Freely

by Bruce Moran

What would happen if the farmers were suddenly deprived of all the scientific knowledge which has been contributed to agriculture during the past 20 years or so? It has come from many sources—the Land Grant Colleges, the county agents, the agronomists attached to our own industry . . . and much of it from the farmers themselves.

The point is that the information has been centralized, fed down to the soil, and back up again to the centers of research. The point is that cooperation has developed in what used to be a house divided. And that cooperation has produced results.

No small part of the credit for this should be assigned to the work of the associations in our field, not only our own N.P.F.I. and the many area and local level groups, but all those others whose research results are laid on the table for all to read, and use.

We can face with confidence the "Fifth Plate" about which we have been warned so often. Our farms will be ready to feed all those extra hungry mouths . . . because of cooperation.

We are ending a year. This is a good note on which to close 1956, and look forward to 1957.

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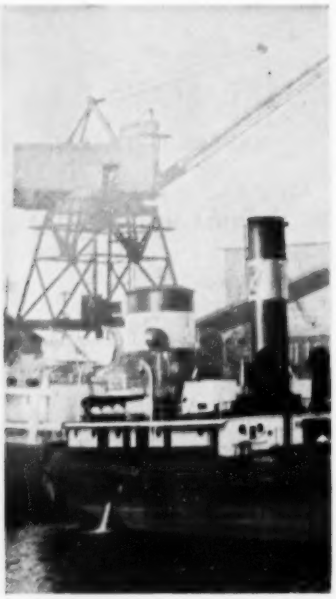
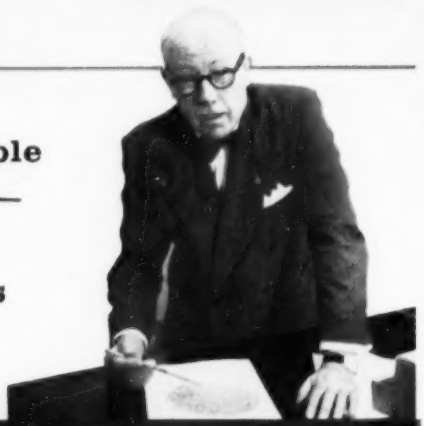


"We like to see our ship come in!"

Mr. Alex Mooney,
General Sales Manager, Fertilizer Division
Canada Packers, Ltd., Toronto, Canada



Boat shipments of International's Triple arrive in excellent physical condition—just right for easy, quick unloading and for excellent ammoniation results

Water shipments mean immediate savings in shipping costs. International's Triple is loaded into ocean-going vessels at Tampa, Florida.

Even after a long, rugged trip, International's Triple unloads easily . . . cutting Canada Packers' handling costs to a minimum.

Nine modern plants make up the Fertilizer Division of the Canada Packers organization. Mixed goods are sold in Canada and the states.

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"Our first shipment of triple docked more than a year ago. It worked out fine . . . so have the rest," says Alex Mooney, general sales manager of Canada Packers' Fertilizer Division. "We're sold on ocean and lake-going vessel shipments, and particularly on the way International's Triple comes through in such fine physical condition."

This alert Canadian firm, headquartered in Toronto, was quick to take advantage of the savings offered by International's water shipments.

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These water shipments are a real test for the shipping and handling qualities of International's Triple. It is subjected to the rugged shipping conditions of ocean, river and Great Lakes travel.

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"In shipment after shipment we have been very happy with the ammoniation quality," adds Mooney. "It's the excellent physical and chemical condition of International's Triple that gives us such results."

Canada Packers is typical of a constantly growing number of firms who have tried International's Triple and have been satisfied.

The reason: Exclusive Bonnie processing produces a triple with built-in extras that help them cut costs. Uniform, fine texture means superior handling qualities. Natural curing for a minimum of 5 weeks gives them better control of manufacturing conditions . . . helps simplify formulation problems.

These users get the extra benefits of a guaranteed constant minimum of 46% APA. What's more, they're sold on International's friendly cooperation; fast, efficient shipping; and a modern warehousing program for off-season storage.

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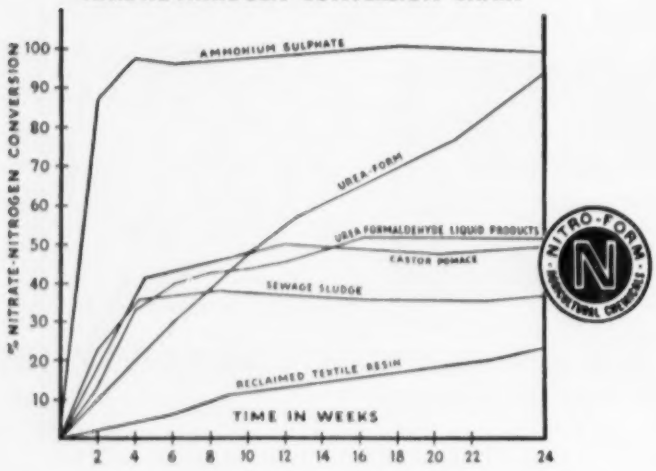

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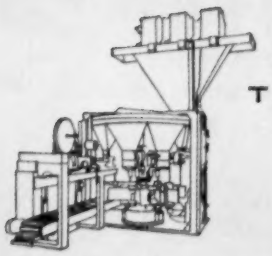

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JUST AROUND THE CORNER *by Vernon Mount*

RUSSIA doesn't want war. England and France recognize their mistake in the Suez situation. The emotional Arabs and Israelis are, of course, unpredictable. So while there may be more local scraps, a general war is highly unlikely.

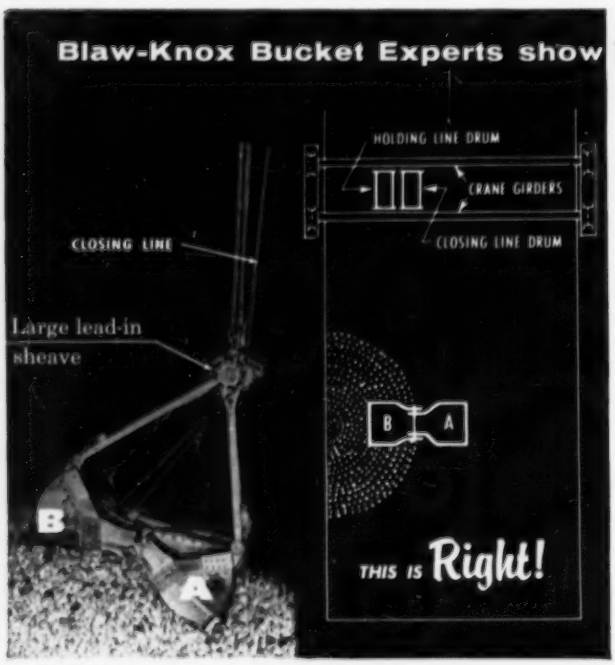
THE UN has gained much stature. It has taken firm stands and they have been followed.

Looked on with cynicism all these years, largely because of what happened to the League of Nations back in the Woodrow Wilson days, it seems to be winning through to the job for which it was designed, and the international respect to which it could be entitled.

YEAR END is upon us. It has been a good year. Next year is likely to be a better year in almost every respect.

Merry Christmas, and a Happy New Year,

Vernon Mount



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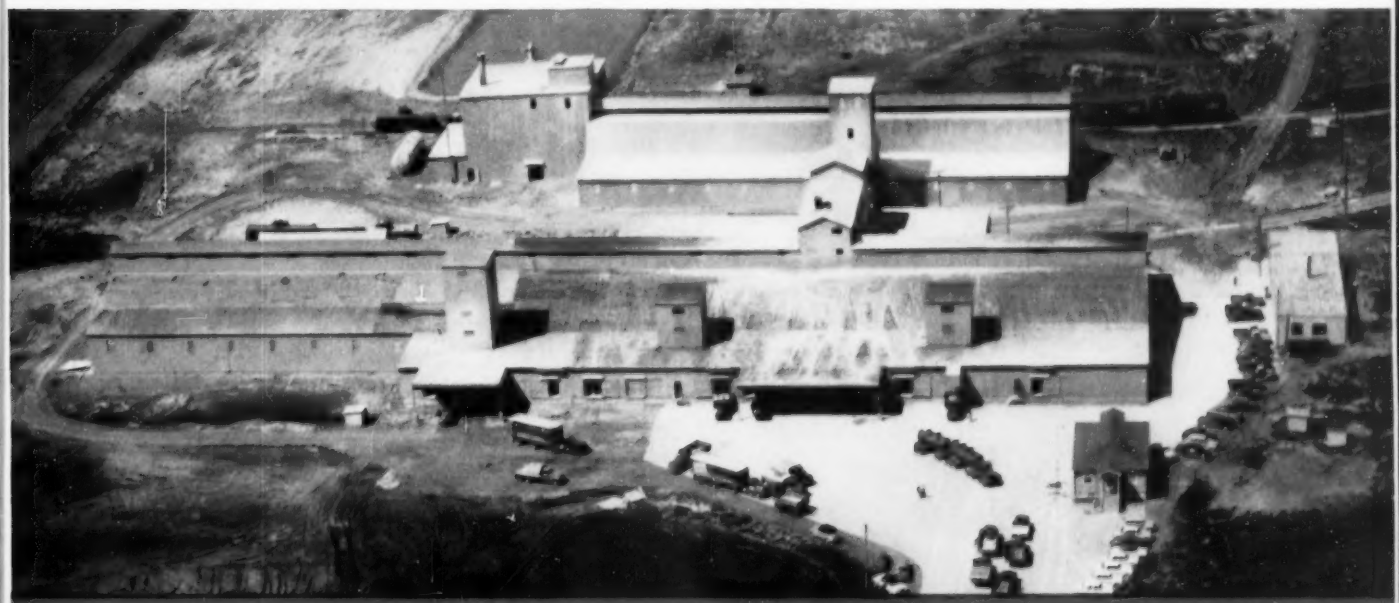

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Exclusive one-lever control handles tip-back, lift, dump and lowering of the bucket, simplifying and speeding operating cycles. The 40 degree tip-back of the bucket at ground level gets and holds big loads close and low without spilling. Hydraulic load-shock-absorber smooths the ride and permits higher travel speeds.

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Greater productivity is only half the story of the model HA, since it can be readily adapted to do many other jobs on either a part-time or full-time basis. Quickly-attached floor sweeper, fork-lift and pusher-fork attachments, plus special buckets are available to further increase its usefulness and make this "PAYLOADER" one of the most versatile, profitable machines any plant can own.

• • • • •

The knowledge and experience gained during the past 30 years in building thousands of tractor-shovels — more wheeled tractor-shovels than all others combined — is your assurance of superior design, engineering and performance. The "PAYLOADER" line is also a complete line — a size for every purpose — bucket capacities from 1¼ cu. ft. to 2¼ cu. yd. There is also a nearby "PAYLOADER" Distributor with complete parts and service facilities.

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New Horizons in the Chemical Industry

The chemical industry, which is now growing at a rate three times greater than the average of the rest of industry, will soon be growing "four, possibly five times as fast," Marlin G. Geiger, executive vice president in charge of the chemical group of W. R. Grace & Co., predicted at a luncheon meeting of the Round Table for Business Executives held at the New School for Social Research, Oct. 25.

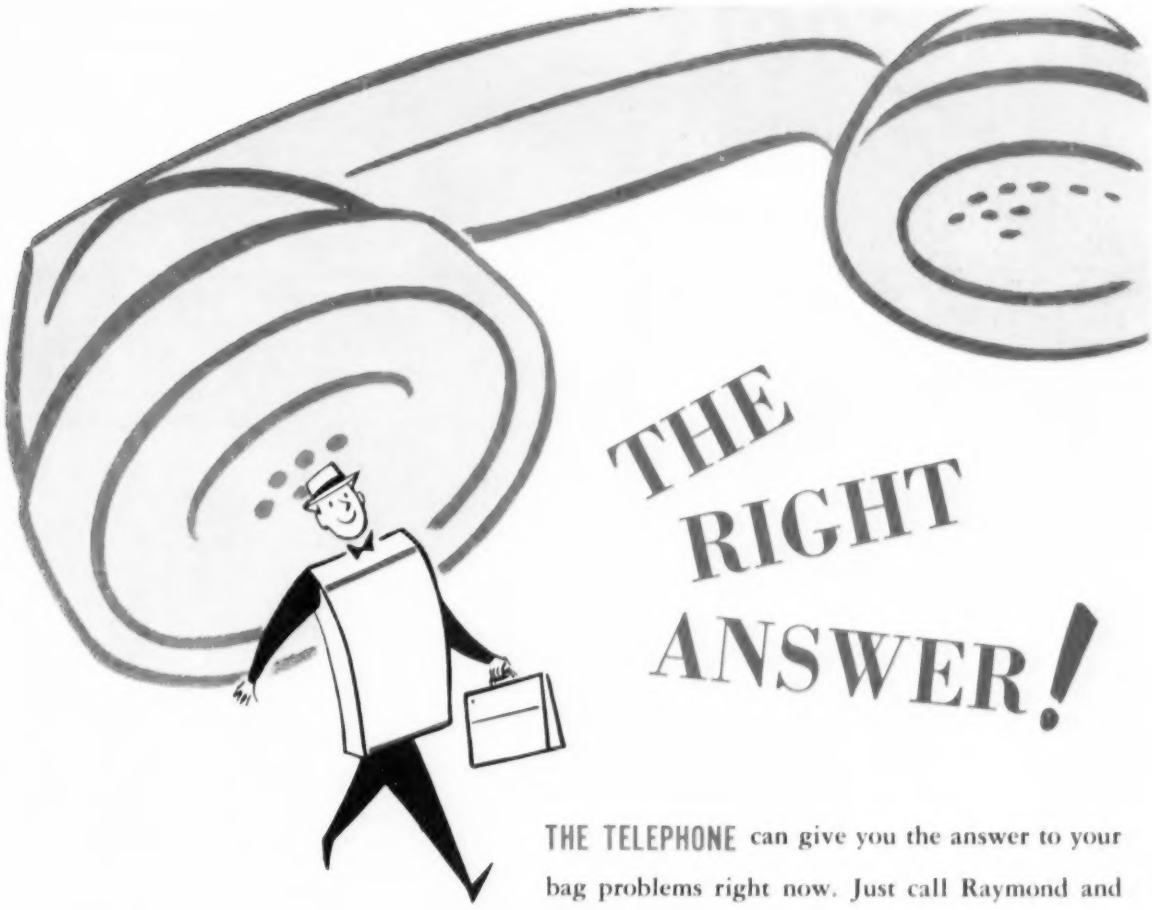
Much of the responsibility for the nation's farm surpluses rests squarely on the shoulders of the agricultural chemicals industry. Radically improved fertilizers have made it possible to raise more crops on the same, or even less, acreage. Our insecticides have protected those crops and made it possible for them to reach temporarily glutted markets. Many new and improved agricultural chemicals are now either in the advanced laboratory stage or practically ready for the market. They will make it possible to increase production still further.

"Fortunately" said Mr. Geiger "we can afford the luxury of looking at the long run. And when we do we see three major facts: Our population is growing at the rate of about 2½ million people per year; 95% of our tillable land is already cultivated; and industry is taking an increasingly large proportion of farm products each year.

"These facts convince us that the revolution we have fired must continue. When Thomas Malthus made his famous and gloomy prediction that man sooner or later faced starvation, his reasoning was not altogether unsound. But he could not and did not consider chemistry and the use that man would make of it.

"The whole petrochemicals industry is currently undergoing a boom of almost fantastic proportions," Mr. Geiger declared, pointing out that this part of the chemical industry is planning a billion dollar expansion during 1956.

Mr. Geiger concluded his remarks with an appeal for trained manpower as the only answer to the industry's—and man's—struggle for growth and survival. "We must," he said, "discover a method of channeling our talent in the directions where it is most vitally needed. The Russians do this with dictatorial efficiency. We'll do it through appeal to the uninhibited incentive of free man."



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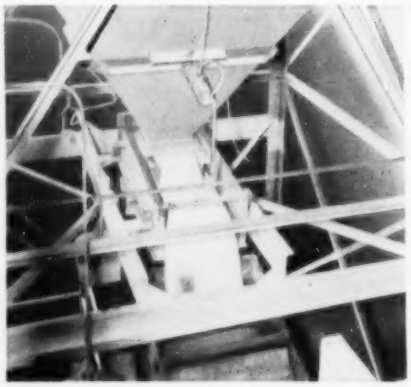
Simplicity Os-A-Veyor Feeders can be bin-hung, as shown in the photograph, or may be spring mounted. The Os-A-Veyor feeds along its entire length and allows for the use of a larger bin, thus avoiding bridging in the bin. Simplicity Os-A-Veyor Feeders have replaceable liners and can be provided with grizzly or screen sections, one or two decks, and can be totally enclosed. Simplicity Os-A-Veyor Feeders are doing a fast, efficient job for fertilizer plants throughout America.



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Grange Asks Change In Parity Determination

Herschel D. Newsom, Master of the National Grange, Nov. 19 called for a basic revision in the Government's method of determining "parity" of farm income with non-farm income, as a major step toward solution of the nation's agricultural problem.

Continued reliance on the present system of determining parity, Newsom said, "tends to indicate that farmers should be frozen in whatever degree of inequity may have existed in the so-called base period of 1910-1914, or some other past period.

"It can scarcely be called an accurate, modern method," he declared, and "little logical defense" can be made for it.

Addressing the 90th Annual Meeting of the National Grange, Mr. Newsom repeatedly emphasized the need for actions to bolster farm income and to gain a better balance with non-farm income. "The present pricing system," he told the session delegates, "fails to take account of substantial and important changes that have taken place in our total economic structure as well as in our productive techniques and methods.

"A fair and equitable return on labor input and capital investment in agricultural productive effort would be a much more reasonable basis for making determination of where real parity of income for our agriculture might lie," Newsom said, "than to continue to make that determination on the purchasing power that may have been derived from agricultural production in some historic base period."

Western Cotton Dates Changed

A change in dates for the 1957 Western Cotton Production Conference has been announced. Originally slated for March 5 and 6, 1957, the conference has now been rescheduled for March 4 and 5, 1957, because of a conflict with another meeting. Conference headquarters will be the Hotel Westward Ho in Phoenix, Arizona.

The change in dates for the Western Cotton Production Conference in no way affects the dates for the Second Annual Beltwide Cotton Production Conference to be held December 13-14, 1956, in Birmingham, Ala.

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State Agricultural Experiment Stations and other authoritative sources are recommending fertilizers with ever increasing plant food units per ton. High analysis fertilizers are in demand because they give more for each fertilizer dollar. Meet this demand by incorporating Davison's New Triple Superphosphate in your formulation.

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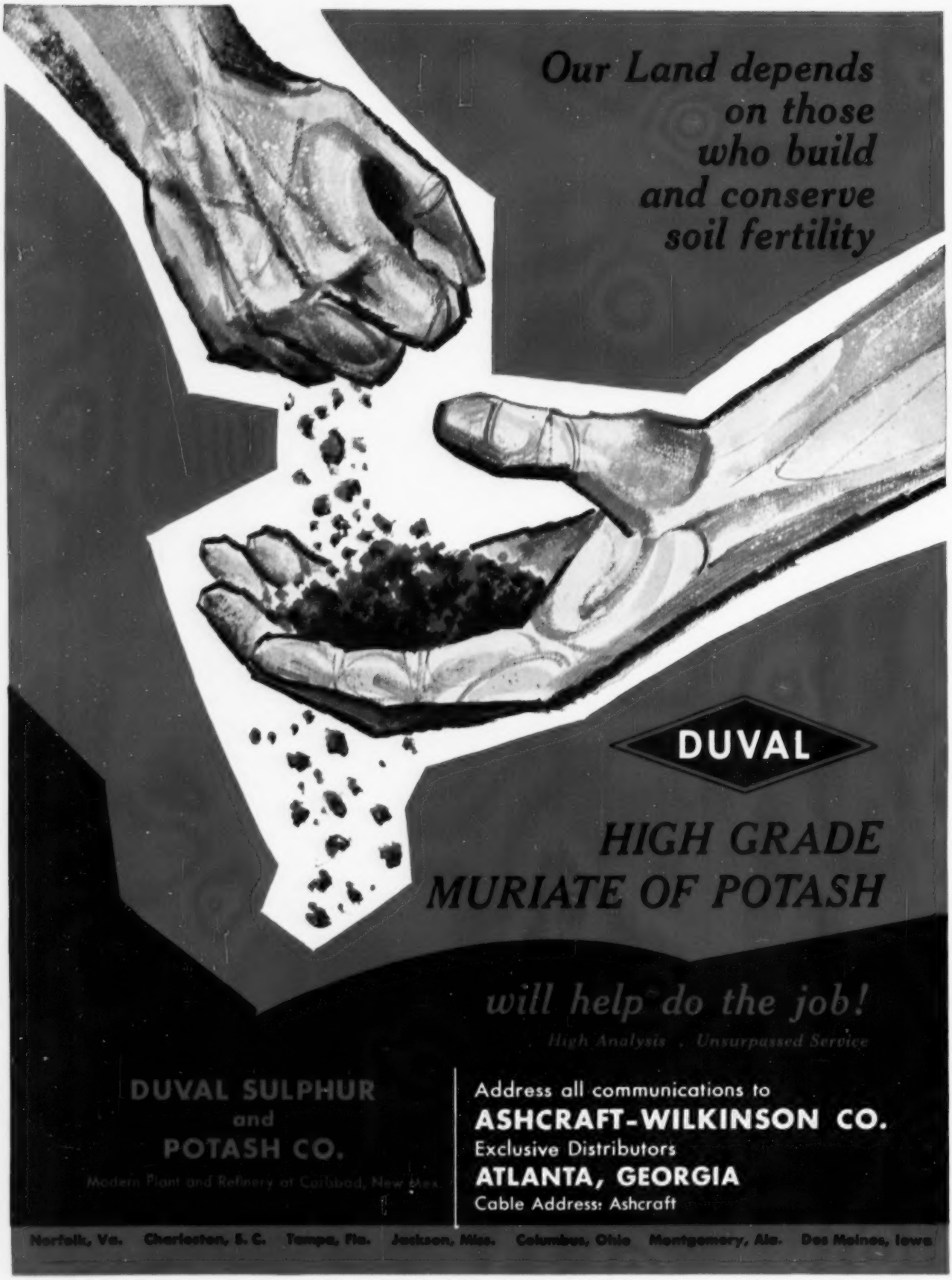
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Arcadian® News

Volume 1 | For Manufacturers of Mixed Fertilizers | Number 2

RADICAL PROPOSALS IN MODEL FERTILIZER LAW

Undesirable to Fertilizer Men and Farmers

At the October 21st meeting of the Association of American Fertilizer Control Officials, a resolution was passed putting the Association on record as favoring the change in fertilizer laws in each state of the U. S. to adopt officially the model uniform law worked out by the Association. This model law, if adopted, would bring about a change in fertilizer guarantees of P_2O_5 to P and K_2O to K. It also includes the optional provision for a requirement of "guarantee of the sources from which the nitrogen, phosphorus and potassium are derived."

We believe that every manufacturer of superphosphate and triple superphosphate should oppose this plan to change the fertilizer guarantees of P_2O_5 to P because of the effects such change will have upon the manufacturers of fertilizer materials, upon the manufacturers of mixed fertilizers, and upon the cost and quality of fertilizers offered to the farmer. We believe the industry should oppose this because of the confusion that will result in the fertilizer industry and among farmers in the years required for the transition. Also, we believe industry should be opposed to the scrapping of all the bulletins at our experiment stations, all the technical articles and all the text books that are written in terms of P_2O_5 and which represent the compilation of data from many years of agricultural research and millions of dollars of state and government appropriations expended in their development.

Special Interests Support Proposal

There are certain interests who expect to gain substantial competitive advantages for products such as di-ammonium phosphate, calcium metaphosphate and phosphoric acid. We understand these interests are putting forth very strong efforts to bring about the change in the guarantee of P_2O_5 to P and that, furthermore, they are working actively to lay the groundwork for injecting into the proposed model bill when it is presented to the separate state legislatures, amendments requiring that minimum water soluble phosphorus be guaranteed.

The reasons for the proposed changes, as given by the A.A.F.C.O., is their desire to simplify the terminology used by agricultural writers in reporting results from experiments involving different forms and amounts of plant foods. If this simplification were the sole objective of those advocating these changes, it would appear easier and less disturbing to industry and to agriculture if the agricultural writers were asked to adopt a code of word usage that would eliminate irregularities in their terminology.

To change the fertilizer laws of 46 states is a tremendous undertaking that will involve the time of many people and much expense that might well be applied to useful legislation. In most states the attempted changes are expected to result in severe legislative battles and it is anticipated there will be many defeats as well as many amendments. This would result in less uniformity than presently exists.

Lower Quality—Higher Cost

Those who are unfamiliar with the technical features of the manufacture of mixed fertilizers may fail to appreciate how a change in the guarantee terminology could greatly alter the competitive relationships of fertilizer materials, substantially modify the composition of mixed fertilizers, reduce their quality, and increase their cost to the farmer. But these would be the real consequences of the proposed change from P_2O_5 to P. Let us present two illustrations of a change that may result.

A popular 10-10-10 fertilizer is presently made somewhat as follows:

		% N	% P_2O_5	% K_2O
1030 lbs. 20% P_2O_5 Superphosphate		0	10	0
250 lbs. 41% N. Nitrogen Solution		5	0	0
90 lbs. 45% N. Urea		2	0	0
300 lbs. 20.5% N. Sul. of Ammonia		3	0	0
330 lbs. 62% K_2O Muriate of Potash		0	0	10
2000 lbs.	**Total Analysis**	**10**	**10**	**10**

When the farmer buys this product, he obtains free about 620 lbs. of calcium sulphate and about 78 lbs. additional sulphur from the ammonium sulphate. Both the soluble calcium and the soluble sulphate are essential plant foods which would need to be purchased by farmers in the humid areas of the U. S. if they were not furnished free in superphosphate.

By contrast, note approximately how a 14-14-14 would

be made under the proposed N-P-K plan:

		% N	% P	% K
1400 lbs. 20% N–53% P_2O_5 Di-Am.Phos.		14	14	0
545 lbs. 62% K_2O Muriate of Potash		0	0	14
55 lbs. conditioner or sand		0	0	0
2000 lbs.	**Total Analysis**	**14**	**14**	**14**

This product would contain no calcium and no sulphur and the N-P-K would each be 100% water soluble. In composition it would be similar to the German Nitrophoska fertilizers which were imported into the Atlantic Coast states in the 1930's and which gave most disappointing results in terms of crop yields.

To a farmer accustomed to a 10-10-10 or a 12-12-12 (on the N-P_2O_5-K_2O basis) a 14-14-14 on the N-P-K basis may not look off balance. It is, however, a 14-33-17 on the oxide basis and a great deviation from the old 1-1-1 ratio.

Most Expensive Form of Phosphorus

Since phosphoric acid, from which ammonium phosphates are made, is by far the highest cost form of P used for fertilizers, averaging nearly twice the cost of P in normal superphosphate, there can be no actual saving to the farmer, to compensate for the loss in gypsum and other nutrients, even when a large saving in freight from a long haul, the lower cost which obtains from fewer bags, and the saving in labor from less bulk handling, are balanced against the higher first cost of the P. Since there is approximately 137 pounds of gypsum in ordinary superphosphate per unit (20 lbs.) of P., in a ton of 14-14-14 (N-P-K) the farmer's loss would be about 1920 lbs. of gypsum.

Would "Junk" Superphosphate

For comparison of costs, we refer to the article by T. P. Mignett, G. C. Hicks, and J. E. Jordan, "Use of Di-ammonium Phosphate in Production of Granular, High-Analysis Fertilizers", Commercial Fertilizer and Plant Food Industry, PP. 24-25, October, 1956—

"Following are the costs at a typical midwestern location of the amounts of concentrated superphosphate and nitrogen solution that are equivalent to 1 ton of di-ammonium phosphate:

21 units N	**0.517 tons N. Sol. (40.6% N)**	**x**	**$57/ton = $29.47**
53.7 units P_2O_5	**1.167 tons CSP (46% P_2O_5)**	**x**	**60/ton = 70.02**
			or a total cost of $99.49

"The delivered price of di-ammonium phosphate may be somewhat less than $99.49 per ton in some locations, but it will probably be more than $99.49 in most locations."

Had these authors used 20% P_2O_5 superphosphate in the comparison, the plant food cost equivalent would have been:

21 units N	**0.517 tons N. Sol. (40.6% N)**	**x $57.00/ton**	**= $29.47**
53.7 units P_2O_5	**2.685 tons Superphos. (20% P_2O_5)**	**x 17.60/ton**	**= 47.26**
			or a total cost of $76.73

This would represent a difference of $22.76 in favor of ammoniated superphosphate. In addition to lower cost, the farmer would obtain without cost, other than transportation and handling, about 1.6 tons of gypsum ($CaSO_4$ $2H_2O$).

The above are some of the obvious reasons for opposing the change. However, there is a more serious danger to the superphosphate industry, and to farmers, in the plan of those who hope to amend the proposed model fertilizer bill by requiring a guarantee of "soluble P" instead of "available P".

Don't Need Soluble P Guarantee

We understand that it is the plan of the group favoring water soluble P guarantee, not to discuss this feature openly until the proper time to introduce the amendment. It seems to be their hope that the change in terminology will slide through the legislature unnoticed.

Presumably it is the further hope of this particular group desiring water soluble P guarantee, that if the first legislatures acting on the so-called model bill do accept the "soluble Phosphorus" amendment, other state legislatures may be more easily induced to approve similar amendments in the interest of uniformity.

It should be realized of course that once the proposed fertilizer bill is introduced into a state legislative body, it is subject to change by the amendments of the various interests who have the political strength to make their wishes stick. Many good legal proposals open up legislative considerations that result in monstrosities not anticipated by the original well-intentioned proponents.

Misleading to Farmer

We are sure that every manufacturer of 20% P_2O_5 superphosphate is aware of the undesirable features of a required, or even a permitted, guarantee of minimum water soluble phosphorus. It would immediately lead the uninformed farmer to believe water solubility to be a desirable property of fertilizer phosphorus. This in turn would induce competing fertilizer salesmen to "sell" phosphorus "solubility" just as they used to "sell" "organic" nitrogen. The natural consequence would be that all fertilizer manufacturers would feel forced to use more water soluble phosphorus than otherwise considered desirable.

There is only one completely water soluble phosphorus fertilizer material that presently can be used in substantial amounts in non-granulated fertilizer mixtures, without destroying desirable physical properties of the mixture. That material is ammonium phosphate (mono- or di-) and, as stated above, it is the most costly of fertilizer phosphorus. It is also considered the least desirable form for the humid soils of the eastern half of the U. S.

Mono-calcium phosphate of superphosphate, an excellent material, is water soluble but it is too hygroscopic and too reactive for satisfactory use in undried mixtures containing the usual nitrogen fertilizer salts and muriate of potash. Also, mixtures of muriate of potash and mono-calcium phosphate destroy fertilizer bags. Consequently, the mono-calcium phosphate of superphosphate must be "neutralized" or changed to the more stable di-calcium phosphate by means of ammoniating media or by other alkaline materials such as lime. This change eliminates water solubility but not desirable availability to crops.

Would Increase Farmers' Cost of N

The fertilizer industry currently uses more than 600,000 tons of nitrogen as ammoniating liquids in "neutralizing" superphosphates, and these liquid forms furnish the lowest cost nitrogen available to the fertilizer industry and consequently to the farmer. In common solid carriers, nitrogen costs from 50 to 100 per cent more than in these low cost ammoniating solutions.

Thus, a legal requirement for a guarantee of water solubility of fertilizer phosphorus would eliminate the full use of ammoniating solutions and raise the farmers' fertilizer costs possibly by $50 million or more per year, including the cost for other needed conditioners when ammoniation is not practiced. Obviously, neither the fertilizer manufacturer nor the farmer will submit to this unwise and costly legal change after the above facts are known.

Need Gypsum from "Super"

As the agronomists and soils specialists of the Carolinas, Georgia, and Florida learned from tests with German Nitrophoska in the 1930's, ammonium phosphate fertilizers do not give good results in the humid soils of the eastern U. S. unless gypsum is added in generous amounts to furnish the calcium and sulphate ions required to give plants balanced nutrition. Gypsum has many desirable functions in humid soils. In addition to supplying available calcium and sulphate ions needed for growth, gypsum is an excellent soil conditioner which is more practical than synthetic conditioners.

Also, when soils are water logged, as often occurs in humid areas, gypsum furnishes oxygen to bacteria growing under anaerobic conditions. However, as bacteria use the oxygen, the sulphur is released to the atmosphere as hydrogen sulphide. This is a means of substantial losses of sulphur and is a reason why annual renewal of calcium sulphate to the soil is desirable.

Consider the major forms of fertilizer phosphorus that will be affected by the proposed law:

a. 20% P_2O_5 superphosphate would be guaranteed as an 8.75% P. This is the lowest cost form of phosphorus. It contains about 60 per cent of gypsum.

This product will be greatly discriminated against by the proposed law, especially so if a guarantee of water soluble is required.

b. 48% P_2O_5 triple superphosphate would be guaranteed as 21% P. This product contains no sulphur.

This product will not be hurt as badly as 20% superphosphate, but will suffer a setback compared to di-ammonium phosphate.

c. 20% N–53% P_2O_5 di-ammonium phosphate would be guaranteed as 20% N–23% P. This product contains no calcium and no sulphur. It is highest in cost of the phosphorus compounds because it is made from phosphoric acid, another costly form. It is entirely soluble.

The proposed change in the law would add tremendously to this product's competitive strength.

d. 64% P_2O_5 calcium meta-phosphate would be guaranteed to contain 28% P. It contains no sulphur and its agronomic worth is still to be proven under varying soil conditions.

This product will be helped by the change from P_2O_5 to P, but not by the water solubility requirement except when treated with sulphuric acid (an additional costly step) in making it suitable for mixed fertilizer use.

Comparison of these materials illustrates how the proposed change in guarantees will make a malproportioned product like di-ammonium phosphate appear to have the balance of a ballet dancer while normal superphosphate will appear to the farmer as low-grade refuse.

Favor Farm Mixing

It should be pointed out further that a big danger from di-ammonium phosphate, to the fertilizer manufacturer, lies in the probability that if ammonia producers shift from production of sulphate of ammonia to production of di-ammonium phosphate, a great proportion of the tonnage would need to be sold direct to farmers, who will combine this with potash to make home-mixed fertilizers.

The potential production of di-ammonium phosphate in the U. S. is very large, and this product, sold either for fertilizer manufacture or for direct use to the soil, may be expected to replace an equivalent tonnage of phosphate as ordinary superphosphate. This in turn would reduce a very large proportion of the lowest cost solution nitrogen now used to ammoniate superphosphate. Every fertilizer manufacturer should study carefully the impact these changes will have upon the profitableness of his mixed fertilizer business over the next decade.

Both of these fish are 18 months old. The small one grew in an unfertilized pond; the large one in a fertilized pond.

700,000 Farm Ponds are a Huge Market for Fertilizers

Every farm pond in your area is a market for mixed fertilizer. These artificial ponds, usually built with the advice of the Soil Conservation Service or the Extension Service, now number over 700,000 in the nation. The needs for water for livestock, soil and water conservation, fire-fighting and irrigation continue to make them popular.

With our expanding population, good natural fishing gets scarcer and more crowded each year. More and more farmers prefer the sport of fishing their own stocked ponds, as recreation for themselves and their families and friends. Fertilizer produces 200 to 500 pounds of fish in ponds of ½-acre to an acre or more in size. Ponds smaller than ¼-acre seldom provide good fishing.

Fish Size Up Faster

Fertilizer booms fishing by providing the essential mineral foods for tiny water plants called plankton. In turn this provides food for insects, small animals and small fish which are food for larger fish. Many states supply fish for stocking such ponds. The most common combination is bluegill bream and bass. Unfertilized ponds seldom provide more than 15 to 40 pounds of fish per year per acre of water surface.

To provide food for the fish, farm pond owners start in early spring by spreading 100 pounds of 2-2-1 or 1-1-1 ratio fertilizer per acre of water surface. Every few weeks another 100 pounds of fertilizer is added—enough to keep the water brownish or greenish in color from the growth of plankton. A common rule is to add fertilizer when you can see your hand clearly as you dip an arm to elbow-depth in the water.

Commercial fertilizer does the best job, according to the experts. Organic fertilizers tend to encourage large algae and other undesirable plant growth. The tiny plants favored by commercial fertilizer not only feed the fish, but also shade out many undesirable pond weeds.

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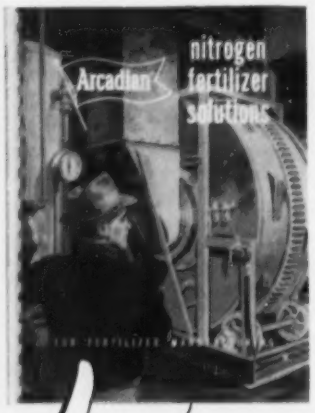
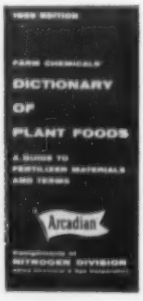


Big, new 48-page technical solutions handbook gives full use data.

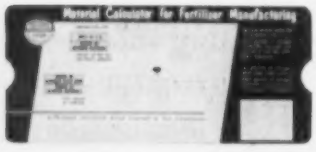
How to make fertilizer enriched with N-dure Urea-formaldehyde solution.

Formulation pad speeds figuring in fertilizer production.



Up-to-date guide to fertilizer terminology (issued annually).

Handy memo pads and notebooks imprinted with the ARCADIAN flag.



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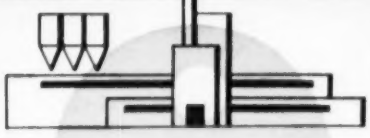

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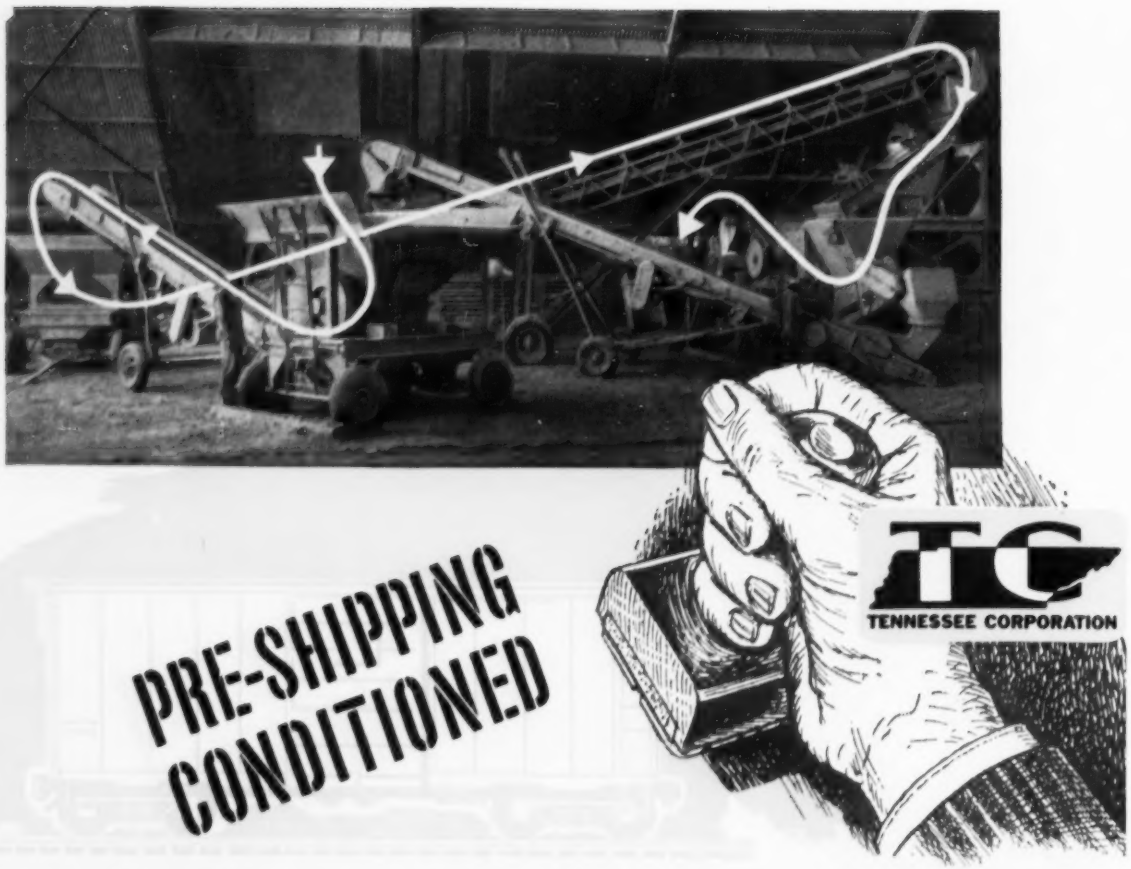

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Technical and Economic Factors Involved in Determining Profitable Fertilization Rates

by
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and

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Iowa State College
Ames, Iowa

This article brings to focus the opinion currently held by many farm management specialists, agronomists, and farmers that average fertilizer recommendations do not fit a large majority of farmers. The principles of determining profitable fertilizer use are demonstrated in this article from results obtained in Iowa. While the results of this study show how fertilizer recommendations can be made to fit Iowa farms, the principles of determining profitable fertilizer use can be used elsewhere.

Farmers have long recognized that average fertilizer recommendations based solely on physical relationships do not always fit their particular farm situations. Results from a recent farm management study in Iowa show why fertilizer recommendations should be based on economic as well as physical considerations.*

The question of how much fertilizer can be used profitably cannot be answered apart from the farm business as a whole. The most profitable fertilization rate depends not only on yield response from fertilizer but also on the cost-returns relationship; the supply of available operating capital, labor, and land; and the leasing arrangement, if the farm is rented. In other words, the proper selection of crops grown in a rotation is dependent on the amount of fertilizer used. But the proper amount of fertilizer to be used also depends on the right amount and kinds of crops and livestock for the farm as a whole. Then, too, a different amount of fertilizer and different kinds of crop rotations are desirable for farmers with different amounts of operating capital.

The objective of a farm, when viewed as a business unit, is not to maximize net returns to a particular crop. Instead, it is to mazimize, for the whole farm, income from a given stock or combination of resources. Since fertilizer represents an alternative use of limited capital, thereby increasing the opportunities for investing limited funds, the farmer must decide at the beginning of each year what part of his limited funds shall be used for fertilizers and what part for other farm expenses. In making this decision he must bear in mind the expected cost and returns from fertilizers against the expected returns for capital invested in other uses on the farm (such as better seed, livestock, machinery, or items necessary to plant more acres).

General recommended fertilizer rates help a farmer to decide on his fertilizer program but they are usually not sufficient. What the farmer with a very small amount of capital would like to know is "Should I apply fertilizers on just part of my farm at the recommended rates? Or should I spread the amount of fertilizer that I can buy over all my farm? What practice would give me the highest return on capital invested in fertilizer?" Likewise, a farmer well supplied with capital may want to go beyond the recommended rates of fertilization and may ask "How much fertilizer can I profitably use on my farm?" Answers to these questions must be obtained if farmers are to realize the most efficient use of their resources.

An ever present problem facing farmers is to reorganize the use of their resources as new farming techniques are developed. While not a new technique itself, heavy fertilization of grain crops in Iowa has not been widespread. Recent agronomic research and farmer experience indicate, however, that heavy fertilization rates can be profitable under current price-costs relationships.

The purpose of this article, then, is to show the principles needed to determine potential fertilizer use. Hence, the emphasis will be upon fundamental principles underlying the determination of profitable fertilizer use, rather than upon results of one particular study. Since the following presentation is based on the results of the Iowa study, one should keep in mind that these results are presented in order to demonstrate these basic principles involved, rather than for the purpose of general application since these results are applicable only to north central Iowa.

Farm Management Research to Determine Profitable Fertilizer Use

The results of a recent study in north-central Iowa in cooperation with TVA to determine the combination of rotations and fertilization to maximize crop profits show that recommendations regarding the most profitable use of fertilizers should vary with the amount of capital and land owned by farmers. Specifically, this study was designed to answer such questions as (1) what rotation should be used when corn can be fertilized at heavy rates, (2) what is the difference in profits for different crop rotations and fertilization rates, (3) how does the most profitable combination of rotations and fertilization rates differ between farms of different sizes and varying quantities of operating capital available for production, and (4) how does the most profitable use of fertilizer change with varying price-cost relationships for typical farm situations.

Answers to these questions are needed by farmers in order to make adjustments to changing economic conditions. This information may also be very useful to the fertilizer industry in estimating fertilizer use potential for a given area and in learning which farmers are the best prospects for increased fertilizer use.

The Iowa study attempts to obtain answers to the questions posed above by treating fertilization as a portion of the total cropping program or farm organization, rather

*Heady, E. O., and others. *Combination of Rotations and Fertilization to Maximize Crop Profits on Farms in North Central Iowa.* Iowa Agricultural Experiment Station Research Bulletin 439, 1956.

than as a separate problem. The empirical technique used in this study is linear programming, a mathematical technique which permits the simultaneous consideration of many possible fertility treatments and rotations by considering different practice estimates or input-output coefficients and prices. This technique allows specification of the most profitable combination of fertilization and rotations by taking into account the supply of available capital, labor, land, and other limiting resources on the farm.

Use of linear programming makes possible consideration of several crop rotations and many different levels of fertilization which other research techniques (such as budgeting) are not able to handle. Actually, linear programming may be considered as a refined budgeting technique which enables one to consider many possible budgets at the same time. Therefore, this study is realistic in that it considers a range of capital and labor conditions under which farmers make decisions. It provides a basis for decision making and a practical approach to fertility problems. While this study applies only to north-central Iowa, the same procedure can be used elsewhere in an analysis of fertilization problems. Thus, this study represents an important step forward in the methodology of farm management research and improved farm planning. The results obtained from a study of this nature can be used as bases for an educational program designed to promote the adoption of improved fertilization practices to improve production efficiency and farm income.

Profitable Fertilizer Use Depends on Supply of Operating Capital

By taking into account the supply of capital available for production, the Iowa study was able to obtain results that could be used as guideposts in making fertilizer recommendations under various farm situations. These results show that the most profitable application of fertilizer, under 1948-52 price-cost relationships, depends on capital availability. It must be remembered, however, that these results apply only to an area where soil erosion is not a problem and where rotations longer than four years and including more than 25 percent meadow are not used. Also these results are valid for the price-cost relationships used. General adoption of these results by farmers might alter the grain prices and hence alter the validity of these results.

Table 1. Optimum Combination of Rotations and Fertilization to Maximize Crop Profits on 160-Acre Farm for Different Levels of Operating Capital Using Prices and Costs of 1948-52

Farm Plan	Capital Level[1]	Most Profitable Rotation[2]	Acres Used[3]	Pounds of Available Nutrients Applied Per Acre on					
				Corn			Oats[4]		
				N	P_2O_5	K_2O	N	P_2O_5	K_2O
1	$1,500	CCOM	80a	0	0	0	0	0	0
2	3,000	CCOM	114	0	0	0	0	0	0
		CSbCOM	34	60	40	30	10	20	10
3	4,500	CSb	90	120	60	40	0	0	0
		CCOM	58	60	40	30	10	20	10
4	Capital not limiting ($4,750)	CSb	148	120	60	40	0	0	0

1. The capital levels used refer to annual operating capital and do not include investment in land, buildings, and machines.
2. The abbreviations for rotations refer to (1) corn-corn-oats-meadow (CCOM) rotations, (2) corn-soybean-corn-oats-meadow (CSbCOM) rotation, and (3) corn-soybean (CSb) rotation.
3. The estimated total number of acres available for crops on 160-acre farms is 148 acres; thus the total acreage for each plan in this column will never exceed 148 acres.
4. Fertilization for the meadow in rotation is supplied on the oats. Fertilizer was not applied to soybeans.
a. A farmer should not farm more than 80 acres if his capital limits him to $1,500 of annual operating expense.

Table 2. Optimum Combination of Rotations and Fertilization to Maximize Crop Profits on 160-Acre Farm for Different Levels of Operating Capital with a 50-Percent Increase in Fertilizer Costs Over 1948-52

Farm Plan	Capital Level[1]	Most Profitable Rotation[2]	Acres Used[3]	Pounds Available Nutrients Applied Per Acre on					
				Corn			Oats[4]		
				N	P_2O_5	K_2O	N	P_2O_5	K_2O
5	$1,500	CCOM	80a	0	0	0	0	0	0
6	3,000	CCOM	124	0	0	0	0	0	0
7	4,500	CCOM	67	60	40	30	10	20	10
		CSbCOM	81	60	40	30	10	20	10
8	Capital not limiting ($5,679)	CSb	148	120	60	40	0	0	0

1. The capital levels used refer to annual operating capital and do not include investment in land, buildings, and machines.
2. The abbreviations for rotations refer to (1) corn-corn-oats-meadow (CCOM) rotation, (2) corn-soybean-corn-oats-meadow (CSbCOM) rotation, and (3) corn-soybean (CSb) rotation.
3. The estimated total number of acres available for crops on 160-acre farms is 148 acres; thus the total acreage for each plan in this column will never exceed 148 acres.
4. Fertilization for the meadow in rotation is applied on the oats. Fertilizer was not applied to soybeans.
a. The farmer should not farm more than 80 acres if his capital limits him to $1,500 of annual operating expense.

However, since the farmers in north-central Iowa produce only a small portion of the total corn and soybean production, general application of these results in this area would not materially affect the prices of corn and soybeans. In formulating an educational program for a larger area than north-central Iowa, the effects of increased production (resulting from the general adoption of the recommended fertilization rates) on product prices should be considered.

Most profitable plans for a 160-acre farm

Optimum, or most profitable, farm plans for a typical 10-acre farm in central Iowa, with different quantities of operating capital available, are given in Table 1. With only $1,500 of operating capital available for crop production—aside from funds invested in machinery and real estate, if the farm is owned—it was found that owner-operator farmers could maximize crop profits if they farmed only 80 of the 160 acres and did not fertilize. Planting fewer than 80 acres of corn and more of oats (a lower capital crop) to get all land under cultivation would lower profits. Hence, the owner-operator with very limited funds would be better off to rent out the remaining acres, or to rent a smaller farm, when he has only $1,500 available for crop production.

For $1,500 of operating capital, the complementary effects of hay in increasing grain yields provides a more economical method of providing fertility than does commercial fertilizer. If part of the $1,500 were invested in fertilizer, less than 80 acres could be cultivated because of the shortage of operating funds.

With $3,000 in operating capital, all 148 acres of cropland could be cultivated and some fertilizer could be applied. With more than $3,000

of operating capital, all cropland could be profitably fertilized. As the supply of capital is increased to $4,500, fertilization of all the cultivated acres becomes profitable but maximum profits are obtained only if two rotations and two rates of fertilization are used over the whole farm (Table 1). It would not be profitable under these price-cost relationships to use one rate of application for the whole farm until the supply of operating capital is increased to $4,750, or when capital ceases to be a limiting factor. Thus, it is clear that a general fertilizer recommendation would not be applicable to all farmers having different amounts of available capital on farms of comparable size. The success of a fertilizer sales program, as well as an educational program on fertilizer use, depends upon the recognition of these fundamental relationships.

Even with a 50 percent increase in the cost of fertilizer over the 1948-52 price-cost relationship, the manner in which farmers with different amounts of operating capital could profitably invest in fertilization (Table 2) does not change. With very limited operating capital ($1,500) it would not pay farmers to invest in fertilizer. As the supply of available capital is increased beyond this minimum level, however, investment in fertilization becomes profitable. However, under the present price-cost relationship, farmers must have more capital before it pays them to fertilize heavily. Also, with higher fertilizer prices there would be more justification for making uniform rates of fertilization for farmers with the same amount of capital but not for different levels of available capital. Changes in the cost-price relationships do not alter the fact that the most profitable fertilization rate depends on the amount of capital available for production.

Under both cost-price relationships considered thus far, heavy rates of fertilization maximize crop profits only when capital is not a limiting factor in crop production.

Most profitable plans for a 240-acre farm

The amount of land, as well as the amount of production capital, a farmer has may affect the profitable use of fertilizers. The farm plans in Tables 3 and 4 show how the most profitable use of fertilizer is affected as the number of acres available for cultivation is increased.

The most profitable farm plans for the very limited and unlimited capital situations on 240-acre farms are identical to those on 160-acre farms except that more acres are included in the unlimiting capital situation for the 240-acre farm. For both sizes of farms, crop profits are highest if a corn-corn-oats-meadow rotation is used with no fertilization when capital is very limited, while the corn-soybean rotation with heavy fertilizer applications makes the most profits when capital is not limiting.

For capital situations between the extremes of very limited and unlimited capital, the most profitable plans for a 240-acre farm would include more meadow and with less fertilizer applied per acre for a given quantity of capital than for a 160-acre farm. As larger and larger amounts of capital become available on a 240-acre farm, fertilization of the total farm becomes profitable and row crops become increasingly important (Table 3). For both sizes of farms, heavy fertilization on all cultivated acres becomes profitable only when sufficient capital is available and therefore is not a limiting factor.

Even when fertilization costs are increased (Table 4), heavy fertilization is still profitable when capital is not a limiting factor. However, when the cost of fertilizer is increased by 50% the profitability of fertilization at lower capital levels is reduced. Hence, in times of falling farm prices and increasing costs of production, farmers with very limited quantities of capital would probably use less fertilizer, while, on the other hand, farmers with ample capital would not change their fertilization practices very much. Thus, to be successful, an educational program or a sales promotional program designed to increase fertilizer use should not be based solely

Table 3. Optimum Combination of Rotations and Fertilization to Maximize Crop Profits on 240-acre Farm for Different Levels of Capital Using Average Prices and Costs of 1948-52

Farm Plan	Capital Level[1]	Most Profitable Rotation[2]	Acres Used[3]	Pounds Available Nutrients Applied Per Acre on					
				Corn			Oats[4]		
				N	P_2O_5	K_2O	N	P_2O_5	K_2O
9	$3,000	CCOM	162	0	0	0	0	0	0
10	4,500	CCOM	178	0	0	0	0	0	0
		CSbCOM	46	60	40	30	10	20	10
11	6,000	CCOM	11	30	40	30	10	20	10
		CCOM	56	60	40	30	10	20	10
		CSbCOM	134	60	40	30	10	20	10
		CSb	23	120	60	40	0	0	0
12	Capital not limiting ($7,375)	CSb	224	120	60	40	0	0	0

1. The capital levels used refer to annual operating capital and do not include investment in land, buildings, and machines.
2. The abbreviations for rotations refer to (1) corn-corn-oats-meadow (CCOM) rotation, (2) corn-soybeans-corn-oats-meadow (CSbCOM) rotation, and (3) corn-soybean (CSb) rotation.
3. The estimated total number of acres available for crops on 240-acre farms is 224 acres; thus the total acreage for each plan in this column will never exceed 224 acres.
4. Fertilization for meadow is applied on the oats in rotation. Fertilizer was not applied to soybeans.

Table 4. Optimum Combination of Rotations and Fertilization to Maximize Crop Profits on 240-acre Farm for Different Levels of Capital When Fertilizer Prices are Increased by 50-Percent to the Highest Price Relative to Corn During Past 15 Years, i.e., (1941-42) and Other Prices and Costs at 1948-52 Average

Farm Plan	Capital Level[1]	Most Profitable Rotation[2]	Acres Used[3]	Pounds Available Nutrients Applied Per Acre on					
				Corn			Oats[4]		
				N	P_2O_5	K_2O	N	P_2O_5	K_2O
13	$3,000	CCOM	162	0	0	0	0	0	0
14	4,500	CCOM	192	0	0	0	0	0	0
		CSbCOM	32	60	40	30	10	20	10
15	6,000	CCOM	48	0	0	0	0	0	0
		CSbCOM	176	60	40	30	10	20	10
16	Capital not limiting ($8,869)	CSb	224	120	60	40	0	0	0

1. The capital levels used refer to annual operating capital and do not include investment in land, buildings, and machines.
2. The abbreviations for rotation refer to (1) corn-corn-oats-meadow (CCOM) rotation, (2) corn-soybean-corn-oats-meadow (CSbCOM) rotation, and (3) corn-soybean (CSb) rotation.
3. The estimated total number of acres available for crops on 240-acre farms is 224 acres; thus, the total acreage for each plan in this column will never exceed 224 acres.
4. Fertilization for meadow is applied on the oats in rotation. Fertilizer was not applied to soybeans.

on soil test but also on what it would pay farmers to use under different prices and capital situations.

Profitable Fertilization Rate for Tenants

The foregoing farm plans are for owner-operated farms. They do not consider the effects of leasing arrangements on farm organization and fertilizer use. Farm plans and rates of fertilization that maximize crop profits for tenants may be quite different, since the tenant—under a crop-share leasing arrangement—gets back only one-half of his investment in producing crops. If the landlord shares the cost of fertilizers, however, the tenant receives the full return on his investment in fertilizers. Thus, in general it may pay tenants to farm fewer acres and to use more fertilizers than owner-operators. As pointed out previously, it is more profitable for an owner-operator to plant some acres before using fertilizers.

Results from the Iowa study show that, for tenants with a crop-share lease, it would be more profitable to use fertilizer on all cultivated acres, regardless of what capital limitations might exist. This study also shows that it would always be more profitable for tenants to invest in fertilizers before investing in livestock. In other words, it would pay them to improve crop yields through fertilization before considering investment in livestock, even with favorable livestock prices. Thus, an educational or sales program designed to promote the adoption of improved fertilization practices or to increase the demand for fertilizers should allow for these different variations in farm situations which may affect the profitable use of fertilizer. The most profitable use of fertilizers will vary from farm to farm, depending upon the quantity of available land, labor and capital, tenure arrangements, and the cost-price relationships.

"The Soil Bank program offers both a problem and a challenge to the fertilizer industry in the year ahead. While many acres of cropland now using fertilizer will be retired from production under this program, there yet is very real reason to believe that this potential loss in sales can be more than offset if the industry takes full advantage of opportunities for increasing consumption, both under the Soil Bank program and on acres not signed up under the program.

"The Soil Bank is likely to have an effect in one way or another on the operations of most members of the fertilizer industry during the coming year. Realizing that each member of the industry would need to make an appraisal of this possible effect on his own operations well in advance of the fertilizer season, the staff of the National Plant Food Institute has undertaken a comprehensive study of the Soil Bank based upon information available at this time. Actually, so many policy and administrative decisions remain to be made, that a fully accurate appraisal of the effects of the program is not currently possible. However, there are certain actions that can be taken by members of the fertilizer industry, particularly at the State and county levels, to influence the manner in which the program is administered."

. . . Russell Coleman, Executive Vice President
National Plant Food Institute

THE SOIL BANK

What It Means To The Fertilizer Industry

WHAT THE SOIL BANK IS

The Soil Bank is designed "to reduce farm production and maintain net farm income" and to increase "on-the-farm conservation."

In each State the Soil Bank is administered by a State Agricultural Stabilization and Conservation (ASC) Committee and in each county by a county ASC committee. The Committee which has been in existence for many years also administers price support and acreage control programs, and the Agricultural Conservation Program (ACP).

The State and county ASC committees have considerable latitude in connection with some phases of policy and administration of the Soil Bank and the Agricultural Conservation Program.

There are two major parts to the Soil Bank—the Acreage Reserve Program (ARP) and the Conservation Reserve Program (CRP).

Acreage Reserve (AR)

This program is designed to bring about immediate reduction in the planted acreage of allotment crops (cotton, tobacco, rice, peanuts, corn in "commercial" corn areas, and wheat in "commercial" wheat areas). The program provides payments on a year-to-year basis for acreage reduction of these crops. CROPS PLANTED ON ACRES PLACED IN THE ACREAGE RESERVE MAY NOT BE HARVESTED OR GRAZED. The only required practice on land placed in the Acreage Reserve is the control of noxious weeds.

ACP payments may be used to help defray the cost of establishing cover or performing other conservation practices on land placed in the Acreage Reserve.

As presented by Dr. M. S. Williams, chief agricultural economist for National Plant Food Institute, at first annual Southern Soil Fertility Conference, Atlanta, November 2.

Conservation Reserve (CR)

This is a long-range program designed to shift less productive land into trees or permanent cover. Any land that has been in harvested crops is eligible for the CR with the exception of that land which has been placed in the AR.

To qualify for the CR, a farmer must establish permanent cover or perform certain other specified practices on the land.

There are two types of payment made to farmers under the CRP. One relates to the cost of establishing cover or performing some other practice. Up to 80 percent of such costs including fertilizer may be made to the farmer under the CRP. This payment is made in the year in which the cover is established and, of course, does not continue in the ensuing years. In addition, a land rental will be paid **each** year,

including the first year, for acres in the CR. The conservation land rental contracts will run from three to ten years.

Land placed in the CR may not be grazed or harvested unless special exemption is granted. Likewise, farmers participating in the CRP will be limited as to the total acreage they may use for producing crops for grazing or harvest.

Agricultural Conservation Program

Related to the Soil Bank is the Agricultural Conservation Program usually referred to as ACP, which has been in operation for many years. Under it the Federal Government shares with farmers the costs of carrying out certain soil-conserving practices such as establishing cover, terracing, drainage, etc. To some degree the Conservation Reserve Program may substitute for the ACP on land placed in the CR. This may have the effect of making available additional ACP funds which could be used to establish cover on lands placed in the Acreage Reserve.

Questions and Answers on The Operation of The Acreage Reserve Program

Q. How much money is available?

A. Congress has authorized $750 million annually for the Acreage Reserve Program.

Q. May farmers receive payments under the Acreage Reserve Program if they elect not to participate in the Conservation Reserve Program?

A. Yes. Individual farmers may participate in the Acreage Reserve Program or the Conservation Reserve Program, or both. However, cropland placed in the Conservation Reserve must be in addition to that put in the Acreage Reserve.

Q. Assuming a farmer participates only in the ARP, how much money might he expect to get?

A. This depends upon the kind and yield of crop and the number of acres which he places in the Acreage Reserve. Below are typical examples of payments farmers may expect to receive from puting specified acreages in the Acreage Reserve.

Probable Payments Under Acreage Reserve Program

Crop	Acres in Allotment	Acres in Soil Bank	Average Normal Yield	Rate Per Unit[1]	Payment Per Acre	Total Payment
Cotton	20	10	309 lbs.	$ .15 lb.	$ 46.35	$ 463.50
Wheat	100	50	16.7 bu.	1.20 bu.	20.04	1,002.00
Corn	100	50	44.5 bu.	.90 bu.	40.05	2,002.50
Tobacco[2]	10	5	1407 lbs.	.18 lb.	253.36	1,266.80
Rice	50	25	2630 lbs.	2.25 cwt.	59.18	1,479.50
Peanuts	20	10	801 lbs.	.03 lb.	24.03	240.30

[1] The only rate announced at the time this table was prepared was for wheat. Rates for other crops are those used in 1956.
[2] Varies by type.

Q. How many acres of each allotment crop might be placed in the ARP?

A. This is still problematical. The only experience with participation for 1957 has been with fall-seeded wheat. Below are our best guesses as to the number of acres which might be put in this program.

Possible Effect of Soil Bank Acreage Reserve—1957

Alloted Crop	Est. Funds to be used in 1957 (millions)	Payment Rates (based on 1956)	Est. Average "normal" yield, 1957	Average Per Acre Payment	Probable Acreage Reduction
Wheat	$268	$1.20 bu.	16.7 bu.	$ 20.04	13,000,000
Corn	215	.90 bu.	44.5 bu.	40.05	5,500,000
Cotton	214	.15 lb.	309 lbs.	46.35	3,500,000
Tobacco	32	.12-.18 lb.[1]	1407 lbs.[1]	253.36	125,000
Rice	16	2.25 cwt.	2630 lbs.	59.18	250,000
Peanuts	5	.03 lb.	801 lbs.	24.03	200,000
Total	$750				22,575,000

[1] Varies by type

Questions and Answers in the Operation of the Conservation Reserve Program

Q. How much money has Congress authorized for payments under the CRP?

A. Congress has authorized $450 million annually for the Conservation Reserve Program.

Q. For what purposes will payments be made?

A. In 1957, about one-half of the funds will be used to pay farmers for rental of cropland set aside under the CRP. The balance of the funds will be used to reimburse farmers for the establishment of cover or for carrying out other conservation practices on the land set aside.

Q. How many years do the CR contracts run?

A. From three to ten years. The minimum of three years is for land already in cover. For land that is seeded to cover, under the program, the minimum is five years. Where trees are planted, the contract is for ten years.

Q. How much rental per acre might farmers receive for land placed in the CRP?

A. The rental varies from state to state but is expected to average $10 per acre for the nation. The rate varies from $7 for Nevada to $13 for Connecticut, Massachusetts, New Jersey, and Washington.

Q. To what extent will farmers be reimbursed for establishing cover on land placed in the CRP?

A. This is largely determined by State and county ASC committees and, therefore, will vary. It can be as high as 80 percent of total cost.

Q. Is there any over-all limitation on the acreage of harvested crops that can be planted?

A. Yes. Any farmer who participates in the CRP (whether or not he also participates in the ARP) must agree to reduce his total crop acreage by the amount put in the reserve. Also, he must maintain the same amount of land in idle or conserving uses as in the past.

Q. How can farmers afford to place productive land in the CRP for $10 per acre?

A. This program is designed specifically to take out of cultivation marginal lands. It probably will not "take in" much good cultivatable land. It is especially adapted for establishing trees. For example, it is possible for a farmer to sign a ten-year contract with the government to establish trees on cropland acres. The government may pay up to 80 percent of the cost of establish-

ment, plus an annual rental payment. At the end of the contract period the farmer should have a good stand of growing timber.

Q. What happens if perennial grass and legume seeds are in short supply?

A. It is reported that farmers will be permitted to qualify for the Conservation Reserve in 1957 by establishing temporary cover where seed for permanent cover is not available.

Effect of Acreage Reserve Program on Fertilizer Sales

History has shown that when the acreage of cultivated land is reduced under a control program, farmers generally tend to increase the amount of fertilizer used on the acres remaining. This should hold true under the ARP in the case of cotton, corn, wheat, rice and peanuts. The rate of fertilization on each of these crops still is far less than the optimum. Tobacco, of course, is much more heavily fertilized except in some areas. We believe that with the exception of tobacco, increased fertilizer usage on the acres remaining will offset much of the loss on those acres removed from the allotment crops. Moreover, some fertilizer is likely to be used on the land placed in the Acreage Reserve, even though there is no provision in the ARP which requires farmers to protect this land (other than to control noxious weeds).

Most farmers in most areas of the nation will find it profitable to establish cover on land placed in the AR, because (1) wind and water erosion will be controlled, (2) land will be built up for future production, (3) since the ARP contracts are expected to run for one year at a time, idled land can fit well into a rotation program, (4) adequate cover is an excellent means of weed control, and (5) Agricultural Conservation Program (ACP) funds ($250 million) may be used to reimburse farmers for a portion of the cost of establishing cover, including cost of fertilizer, on land idled under the ARP.

A more detailed discussion of the possible effects of the ARP on individual crops and fertilizer usage follows:

WHEAT

As of now, we estimate that 13,000,000 acres of wheat land will be placed in the AR. Of the more than 10 million acres of winter wheat signed up in the AR so far over 80 percent is in Kansas, Oklahoma, Nebraska, Colorado and Texas. Much of the sign-up is from marginal land. We estimate that 150,000 tons of fertilizer could be lost throughout the country because of wheat reduction. This loss could be very damaging to certain fertilizer plants largely dependent upon wheat as a fertilizer outlet. This could be true both in the areas of extensive sign-up and in localized eastern areas.

Let's encourage farmers to use more fertilizer on the remaining acres in order to cut unit costs. Also, of the land removed from wheat there are at least 2,000,000 acres on which fertilized cover should be established. Let's sell the farmer on establishing a properly fertilized cover on these acres.

CORN

In 1956, 5.5 million acres of corn land were placed in the AR. We estimate that approximately this same acreage will be put into the AR in 1957. The bulk of the 1956 participation either was "accidental" or occurred in the drought areas of the Eastern Corn Belt. We expect that a substantial part of the 1957 participation also will be in the more marginal areas. For this reason the total potential loss in fertilizer consumption in 1957 probably is not greater than 100,000 tons. We believe that this may be more than offset by increased rates of fertilization on the acres remaining. The bulk of this compensating increase, however, is likely to come in the areas where ARP participation is not great. As a result, while the over-all corn picture is relatively favorable, fertilizer sales in areas of heavy participation may be hit seriously.

Corn acreage in the drought areas signed under the ARP in 1956 generally was lightly fertilized, and much of it was distressed corn which was disked up when it became apparent that yields would be far below normal. Per-acre Soil Bank payments on this distressed corn land were scaled down.

In order to attract this same corn land into the AR in 1957, heavier Soil Bank payments probably will be necessary. We believe that these increased payments will absorb most of the additional funds that will be available this year for corn under the ARP. We also believe that most of the fertilizer loss on corn as compared with last year will be in the drought areas.

"Accidental compliance" accounted for most of the balance of the corn acreage placed in the AR in 1956. Farmers who had intentionally stayed within their corn acreage allotments in 1956 for price support purposes received "windfall" Soil Bank payments based on the difference between their acreage allotments and the newly devised acreage base. Such "windfall" payments cut neither production nor fertilizer consumption as compared with the preceding year and are not expected to do so in the coming year.

Outside the "commercial" corn areas, corn acreage is not eligible for the AR. The trend toward increased fertilizer rates on these 25 million acres of "non-commercial" corn is likely to continue in 1957. This represents a potential increase in the fertilizer market in these "non-commercial" areas.

COTTON

We estimate that about 3,500,000 acres of cotton will be removed from production and placed in the AR. This, we think, could result in a net loss of 100,000 tons of fertilizer used on cotton.

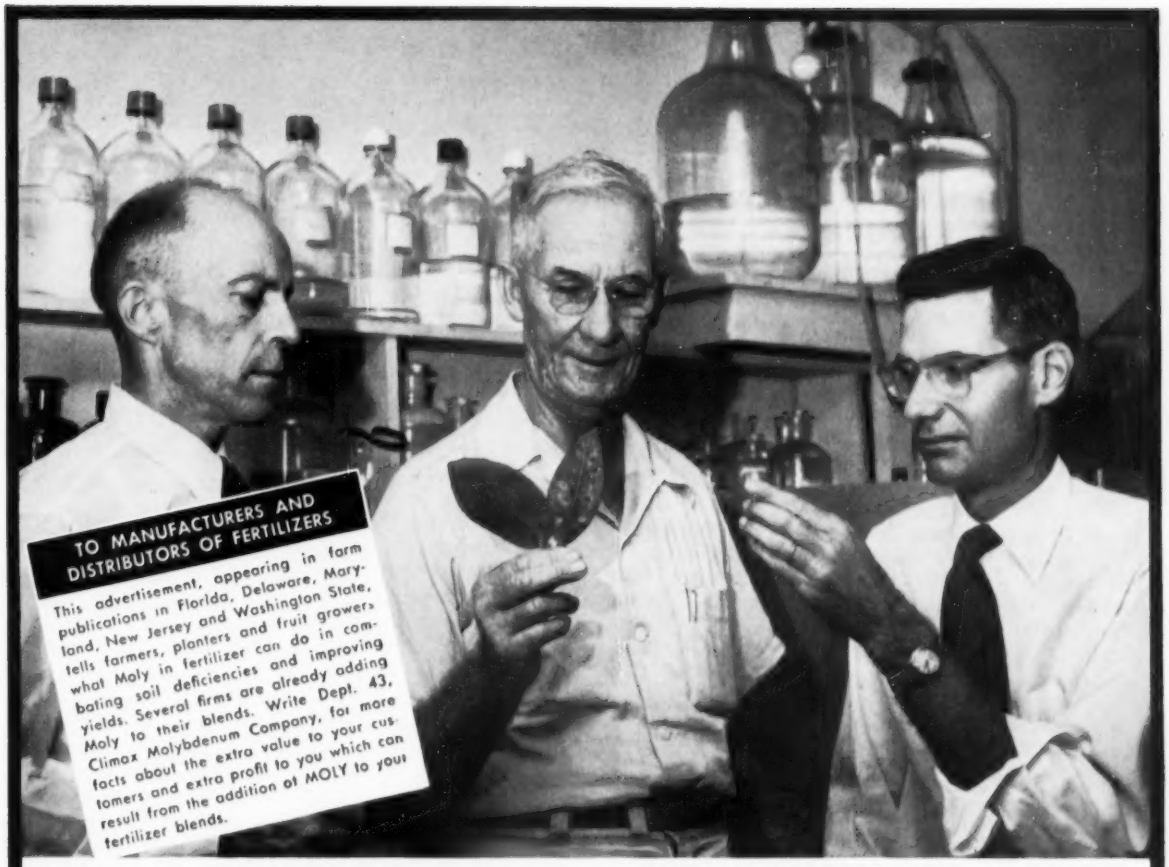
About 1,800,000 acres probably will come from the dry areas of Texas and Oklahoma. This cotton normally does not receive much fertilizer. However, such a decline might reduce sales materially for certain manufacturers serving this area. About 200,000 acres are estimated to be removed in the far western irrigated areas. A decline here will mean some reduction, especially in nitrogen. The 1,500,000 acres estimated to be removed in the States of Arkansas, Louisiana, Mississippi, Missouri, Alabama, Georgia, South Carolina, North Carolina and Tennessee could result in an appreciable fertilizer loss. However, the 1,500,000 acres removed from the humid areas of the Cotton Belt are good potential outlets for fertilizer for the establishment of cover. Let's try to get these acres covered.

PEANUTS

The payment for peanuts is not a sufficient incentive to remove large acreages. Only those marginal acres which are low producers probably will be removed from this crop. Of the 1,700,000 acres planted now, we estimate that 200,000 acres might be removed. This should not reduce fertilizer usage more than 15,000 tons. Only the runner and Spanish varieties are eligible for the ARP.

RICE

We estimate that 250,000 of the 1,600,000 acres of rice might be removed. These will probably be acres which need to be and would have been rotated out of rice. We esti-


TO MANUFACTURERS AND DISTRIBUTORS OF FERTILIZERS
This advertisement, appearing in farm publications in Florida, Delaware, Maryland, New Jersey and Washington State, tells farmers, planters and fruit growers what Moly in fertilizer can do in combating soil deficiencies and improving yields. Several firms are already adding Moly to their blends. Write Dept. 43, Climax Molybdenum Company, for more facts about the extra value to your customers and extra profit to you which can result from the addition of MOLY to your fertilizer blends.

C. D. Leonard, L, and Ivan Stewart, R, Florida Citrus Experiment Station, talking with A. C. Mathias, citrus grower. Doctors Stewart and Leonard established the fact that *yellow spot* on citrus leaves is caused by molybdenum deficiency. They also showed that moly spray effects a rapid recovery of citrus trees affected by this deficiency disease. Many Florida citrus growers are now using molybdenum.

Florida experience shows how Moly controls crop disease

Water soluble Molybdenum can be spray-applied alone or mixed with other sprays.

Yellow spot on citrus leaves is caused by molybdenum deficiency, research discloses, and it can be controlled by spraying affected trees with sodium molybdate. Now Florida citrus growers are using molybdenum for the control of yellow spot.

All crops need moly—Other scientific tests conducted by experiment stations over the past 15 years have shown that moly is needed in *all* crops. If molybdenum is not present in the soil in a form *available* to plants, then it should be added. In legumes moly fixes nitrogen in root nodules. Moly acts in all crops to reduce nitrogen in the leaves. With such varied crops as tobacco, sugar beets, tomatoes, broccoli and rutabagas, added traces of moly make the difference between scanty growth and vigorous, healthy yields.

County agents can help — It may be that your own soil is deficient in available moly. Your county agent or soil conservationist will be glad to talk with you about the problem. Write for our bulletin, "Testing for Molybdenum Deficiency". Climax Molybdenum Company, Dept. 57, 500 Fifth Avenue, New York 36, N. Y.

MOLYBDENIZED FERTILIZERS
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Davison Chemical Company
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The Summers Fertilizer Co., Inc. McKeesport, Pa.

CLIMAX MOLYBDENUM

Pronounce it: Mo-LIB-de-num or call it Moly

mate that the removal of these acres will not reduce fertilizer more than 20,000 tons. It should be recognized that although the total reduction of fertilizer on rice may be small, this is a regional crop and the reduction might be substantial to manufacturers operating in rice areas.

TOBACCO

We expect a substantially greater reduction in tobacco acreage by reason of reduced acreage allotments than by reason of acreage placed in the Soil Bank. In the case of flue-cured tobacco, we understand that the national acreage allotment might be reduced as much as 25 percent. Such a serious reduction in acreage would mean at least a 20 percent reduction in fertilizer used on these acres. The reduction of burley tobacco may not be as serious but, in any case, any lower allotment will reduce fertilizer usage more than the Soil Bank. The double-barreled effect of the Soil Bank and reduced acreage allotments will seriously affect the fertilizer industry operating in the tobacco region. This effect will undoubtedly be more serious in the heavy fertilizer-consuming areas of the Carolinas than in the region of Kentucky where much tobacco is not yet fertilized to optimum rate. Since acreage allotment restrictions are not known, no reliable estimate can be made of Soil Bank participation. However, on the basis of limited data we would expect the Soil Bank to reduce the amount of fertilizer used on the tobacco by not more than 50,000 tons. Connecticut Valley tobacco acreage was drastically reduced in 1956 due to the Soil Bank.

Effect of Conservation Reserve on 1956-57 Consumption

Twenty million acres is the goal established by the U. S. Department of Agriculture as the amount of land which should be placed in the CR in 1957. In most cases, acreage placed in the CR must be put in permanent cover to qualify for CR payments. CR regulations will provide for the use of fertilizer in connection with the establishment of permanent cover on a great deal of the acreage.

Perhaps 4-5 million acres placed in the CR will continue in grass cover now established. Some land will not be seeded to cover due to drought conditions, and some will be devoted to water conservation uses. About 400-500 thousand acres are likely to be placed in trees in 1957. Limited nursery stocks will prevent more acreage from being planted to trees. Of the remaining land which presumably will be devoted to new seedings, we estimate that about 7 million acres will be fertilized. When the amount of fertilizer previously used on these acres is taken into consideration, it appears that a net increase of the order of 500,000 tons is possible as the result of the CRP in 1957.

Of course, the application of fertilizer in connection with the establishment of cover on a given piece of land will not be repeated in the succeeding years. Relatively insignificant amounts of fertilizer will be applied to CRP lands during the second and successive years of the contract.

Net Total Effect of Soil Bank On National Fertilizer Consumption (1956-57 as compared with 1955-56)

A summation of the effects of the ARP on fertilizer consumption of allotment crops indicates a net total national reduction in 1957 of about 400,000 tons. This loss should be slightly more than offset by increased fertilizer usage under the CRP. Thus our analysis indicates that the net overall effect of the Soil Bank on fertilizer consumption in 1957 will be a 0.5 percent increase.

This would seem to indicate that the Soil Bank Program will have little effect on fertilizer sales in 1957. Actually consumption in many local areas will be affected substantially and the effect on some individual plants could be serious. Also, the Soil Bank program undoubtedly will change crop patterns in many parts of the country and therefore will tend to affect the kinds and types of fertilizer used.

Other Factors Affecting Fertilizer Consumption

Farmers who participate in the ARP but **not** in the CRP are **not** subject to an over-all limitation on harvested crops. If such a farmer has idle land or rotation hay or pasture, he can maintain his acreage of harvested crops by planting such land to a small grain, soybeans or other non-allotment crop. Similarly, in summer-fallow areas, farmers could use a portion of the usual fallow land for alternate cash crops.

Assuming that all the money authorized for the Soil Bank is paid out in 1957, farmers are likely to have from $500 to $700 million in extra spendable cash income. The effect of this extra income is likely to be more significant for the 1957-58 fertilizer year, however.

The possibilities for the use of fertilizer to establish cover on idled Acreage Reserve land may be greater than we have estimated. We estimate that of the 22-25 million acres to be placed in the AR, 6½ million acres will require cover for soil fertility maintenance. This acreage offers a good opportunity for fertilizer usage. ACP funds may be used to pay farmers up to 50 percent of the cost, including fertilizer, of establishing cover on these acres. Use of fertilizer at recommended rates on these 6½ million acres could result in an increase in the fertilizer market of as much as 1 million tons. The extent to which this land is covered, and the amount of fertilizer used will depend in a large degree upon the policies and actions of the State and county ASC committees.

Annual consumption of fertilizer has tended to level off in the last 2-3 years, with tonnage actually decreasing slightly. The possible effect of this recent over-all trend, as well as other factors not directly

WHAT MEMBERS OF THE FERTILIZER INDUSTRY CAN DO

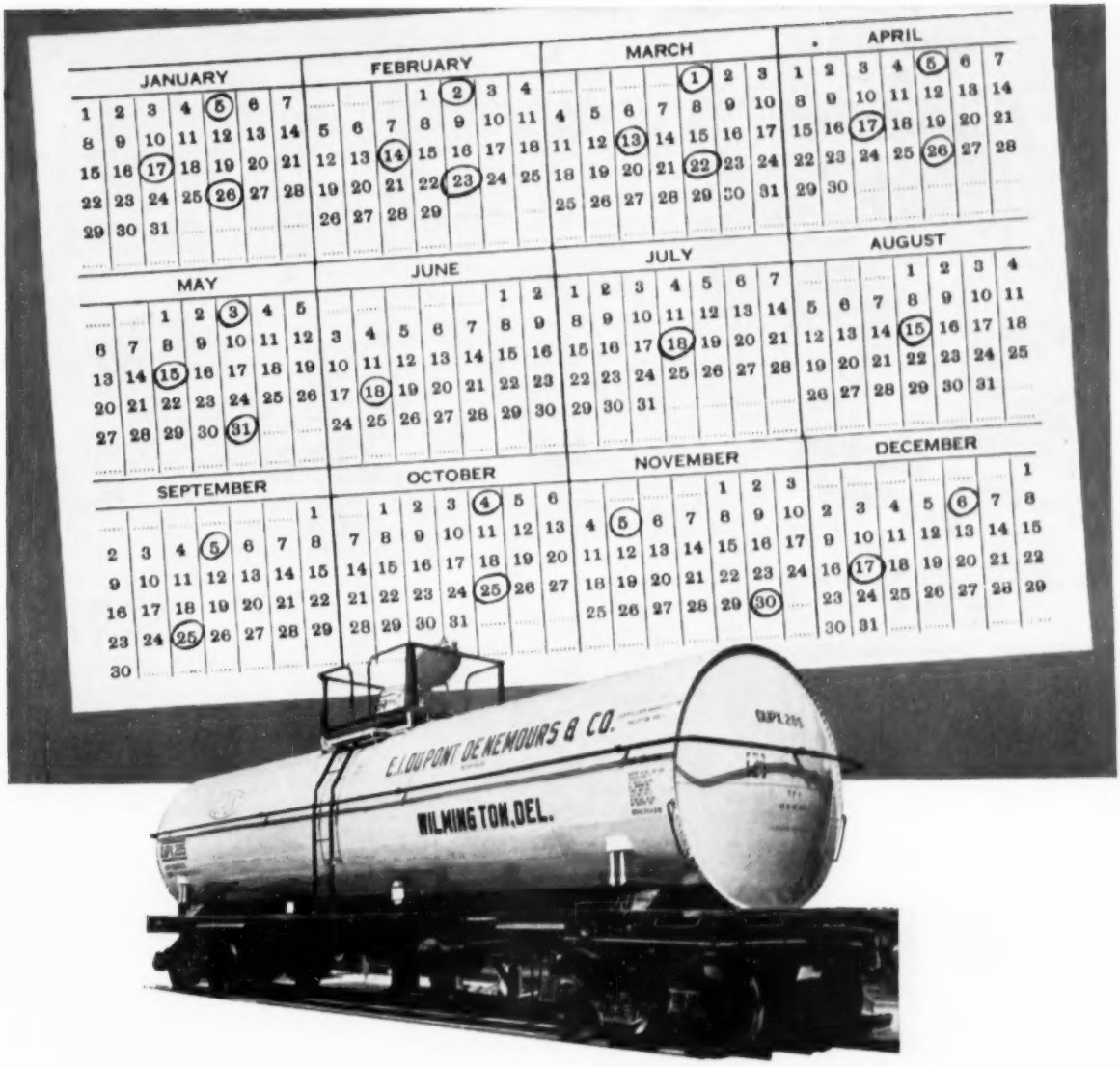
1. Establish and maintain contact with State and county ASC committees. These are the people who will determine how the program is operated in States and local areas.

2. Insist on the ASC committees encouraging farmers to establish cover on those acres taken out of cultivation. Soil fertility value far in excess of the total potential gain under the Soil Bank could be lost in a single year by not properly protecting these idle acres from wind and water erosion.

3. Sell farmers on the idea of increasing profits by reducing production costs through the use of more fertilizer on those acres not pledged to the Soil Bank.

4. Have salesmen learn as much about the program as possible — where more fertilizer can be used to advantage in the areas they service. (For example, the ARP seems to tie in very well with a rotation system of farming.) Encourage farmers to take advantage of all opportunities to maintain and increase income.

5. Work closely with **all** local agricultural workers; i.e., SCS personnel, county agents, vocational-agriculture teachers, etc., to see that no opportunity is lost to get fertilizer properly used.



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related to the Soil Bank, are not taken into account in this survey.

Summary

1. The Acreage Reserve portion of the Soil Bank is likely to remove from cultivation in 1957 from 22-25 million acres of allotment crops.

2. When compensating factors are taken into consideration, the AR is likely to result in an over-all net loss in fertilizer consumption of around 400,000 tons.

3. Additional fertilizer used to establish new seedings under the Conservation Reserve portion of the program, when adjusted for fertilizer previously used on this land could result in a net over-all increase in fertilizer consumption of around 500,000 tons.

4. Consumption in many local areas will be affected substantially, and the affect on some individual plants may be serious.

5. Net direct effect of the Soil Bank could be a 0.5 percent increase in fertilizer consumption plus additional indirect opportunities for increased consumption such as on idled Acreage Reserve land, provided the fertilizer industry takes full advantage of available sales opportunities.

Omega Bulletin On Feeders

The accurate feeding of two or more liquids and/or solids into continuous processes . . . by gravimetric or volumetric means . . . to suit almost any process requirement . . . can be accomplished by the proportioning equipment described in a four page Bulletin 10-N1 just issued by Omega Machine Company, division of B-I-F Industries, Inc., Providence, R. I.

This bulletin illustrates and gives specification data—capacities, accuracies, ranges, types of materials handled, etc.—on many types of feeders, lime slakers and proportioning pumps; and also shows typical control panels. It pictures and describes representative installations where various equipment combinations have been engineered to meet specific needs . . . and to bring continuous processing to industrial operations seeking increased profits through greater production or competitive advantage. Bulletin 10-N1 lists many industries already served by this equipment.

For your free copy of Bulletin 10-N1 write Omega Machine Company, 345 Harris Avenue, Providence, R. I.

BOOKS

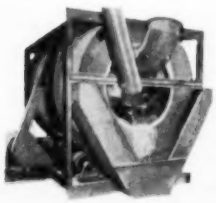
Samuel L. Tisdale, North Carolina State College and **Werner L. Nelson,** formerly of North Carolina State and now American Potash Institute's mid West manager, have written a fine textbook "Soil Fertility and Fertilizers," published by the College Dept. of MacMillan; price $7.50. A feature of its presentation is the thorough way in which it is indexed for quick reference, and of course the thorough way it covers the subject. Such often-neglected points as methods of calculation are fully explained. It is a book that not only belongs in curricula, but as a quick-reference work in fertilizer plants and sales offices.

• • •

A Report, result of a survey conducted by **Dr. George W. Cooke** of Rothamsted Station, England, on the agricultural value of phosphate fertilizers using little or no sulphuric acid. This is a 100 page book, price $1, which is important to all who are studying this recent development in the production of fertilizers during times of sulphur shortages.

J. R. Clements (right) vice president of Raymond Bag Corporation looks over the shoulder of T. H. Bacon, assistant sales manager, as features of Raymond's new Raylox valve are explained to (left to right) district sales managers S. G. Shetter, T. B. Athey, R. W. Drury and D. F. Wicks. The occasion was the first general sales meeting of the combined staffs of Raymond and Albemarle Paper Mfg. Co., of which it recently became a division. Heads of manufacturing, research, product development, advertising and other divisions from the corporation's Middletown, Ohio and Richmond, Virginia plant locations spoke at the meeting, held early in November at the Lake Shore Club, Chicago.

NEW STAR* OF THE SACKETT GRANULATING TEAM



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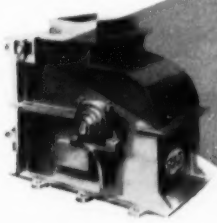
More granulation the first time through, means substantially higher production capacity.

LOWER DRYING COST
Higher percentage of on-size in initial granulation means less fuel cost per ton due to lower hydration of total feed.



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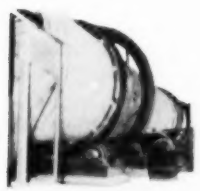

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Ammonia Group Sees More Stable Future

Agricultural Ammonia Institute's sixth annual convention drew a near capacity crowd to Atlanta November 7-9, with representation from most of the 38 states and three foreign countries where AAI's 534 members are located.

The three-day program featured business sessions on the opening afternoon and the following morning, with a trip to the Georgia Experiment Station at nearby Griffin that afternoon for demonstrations of application equipment. The final day saw morning and afternoon sessions topped off with a reception by the nitrogen producers and the annual banquet that evening.

A kick-off luncheon, at which Program Chairman Jeff I. Davis, Jr., of Southeastern Liquid Fertilizer Co., Albany, Ga., presided, got the convention under way. Ivy Duggan, vice president of Trust Co. of Ga., Atlanta was luncheon speaker. He reviewed today's agricultural picture with its mounting surpluses, then offered encouragement in the form of projections of food and fiber requirements to 1960 and 1975. He traced the relationship of annual fertilizer purchases to gross farm income by years since 1920, pointing out that the money spent for plant foods was constant at two percent of farm income from 1920 to 1949, was increased to three percent for the 1950-53 years, and has stood at four percent in 1954 and 1955. "During the next few years," Mr. Duggan concluded, "most farmers cannot afford to greatly reduce their use of fertilizer."

At the business session after the luncheon, members heard a message from the Institute's president, a report from the treasurer and from the executive vice president, and from the chairman of the Educational Publicity committee, then elected a new slate of directors.

AAI President Ralph H. Wooten of Mid-South Chemical Corp., Memphis, summarized the Institute's 6-year history, cited the industry's problems and related what has been done during the past year toward their solution. He pointed out that the organization's membership has grown to a total of 534—382 dues-paying and 152 honorary and scientific members—covering most of the U. S. along, with Canada, Puerto Rico and Mexico. Of the active members, he related that 218 are distributors, 36 are producers, 106 are equipment manufacturers and 22 are affiliate members.

Ammonia's acceptance has grown from 7% of the total nitrogen market to 21% in the six years of AAI's existence, he stated, and the rapid expansion of production facilities in the same period has tended—along with unsettled market conditions resulting from a combination of national agricultural policies, drought, and the changing industrial situation—to beset the industry with a great many difficulties in recent months.

Gen. Wooten recalled some recommendations of the Midwest Research Institute's survey released early this year, and told how AAI's board and committees have been working toward making them effective. He pointed out that these recommendations to the dealer included: personal selling in his market area; offering year-round service to the farmer rather than just contacting him at application time; emphasizing price advantage and ease of handling; financing, selling, or renting of application equipment to the farmer; setting out test-demonstration plots with nitrogen supplied by producers for that purpose.

The report urged producers, he reminded, to financially support the AAI in experimentation and research, to hold direct competition with distributors at a minimum, and to follow through by contacting extension services to acquaint them with advantages, costs and technical points concerning ammonia.

The Institute itself, Gen. Wooten continued, was advised to: coordinate promotional efforts and aim an educational program at the farmer that will benefit total nitrogen as well as ammonia itself; inaugurate a market study to delineate geographical areas of advantage for ammonia; encourage improvement of equipment, especially toward reducing cost of storage and application equipment within reach of the market's financial capabilities; study distribution costs and develop accounting data systems that will enable the distributor to evaluate his own costs; increase AAI membership by admitting more small distributors.

The latter recommendation is being carried out, he said, by elimination of classification fee and lowering minimum annual dues to $25 for members doing $25,000 or less business. As for any idea of converting the Institute to a Nitrogen Institute, the president concluded that distributors "will need a lot of convincing" before they can be convinced of the merit of such a move.

AAI Officers & Directors

New directors elected by the Institute membership for three-year terms were: Frank J. Archibald of St. Clair Grain & Feeds, Ltd., Chatham, Ont., Canada; Herbert A. Buehler of Buehler Tank & Welding Works, Los Angeles; Felix Harvey of L. Harvey & Sons, Kinston, N. C.; H. B. Howe of Howe Ice Machine Co., Chicago; R. C. Singletary, Jr., of Blakely Peanut Co., Blakely, Ga.; and C. J. Struble of Standard Oil of Indiana, Chicago. Re-elected to the board were Miller Carpenter of Missouri Growers Association, Carrollton, Mo., and Fred Stewart of Agricultural Ammonia Service, Santa Paula, Calif. At the annual board meeting Nov. 7, Mr. Stewart was elected by unanimous vote to serve the Institute as president in 1957. He will succeed Maj. Gen. Ralph H. Wooten, U. S. Air Force, Ret., of Mid-South Chemical Corp., Memphis. Mr. Stewart is vice president and general manager of Agricultural Ammonia Service—one of the major West Coast distributors of synthetic nitrogen. Other officers elected were: Paul Duesterhaus, president of Duesterhaus Farm Supply Co., Fowler, Ill., first vice president; Charles Corken, president of Corken's Inc., Oklahoma City, re-elected second vice president; Mike H. Carter, general manager of Farmers Supply Co-operative, Greenwood, Miss., re-elected secretary; and Murray O. Rasberry, president of Delta Butane Gas & Fertilizer Co., Helena, Ark., re-elected treasurer. Two other directors designated by the board to serve with the new officers on the executive committee were Gen. Wooten as retiring president and J. M. Porter, assistant manager of the Nitrogen Department Agricultural Chemical Division, American Cyanamid Corp., New York City.

J. R. Adams | Byron T. Shaw | Max Fetty | George A. Rogler | W. R. Thompson | D. R. Dodd

NEW AAI OFFICERS AND EXECUTIVE COMMITTEE

SEATED: First Vice President Paul Duesterhaus, Duesterhaus Farm Supply, Quincy, Ill.; President Fred M. Stewart, Agricultural Ammonia Service, Santa Paula, Calif.; Secretary Mike H. Carter, Farmers Supply Cooperative, Greenwood, Miss. **STANDING:** Frank Jordan, Executive Assistant, AAI, Memphis; William M. Hunt (representing re-elected Vice President Charles M. Corken, who was unable to attend due to the serious illness of his father), Corken's, Inc., Oklahoma City; Executive Committeeman J. M. Porter, American Cyanamid Co., New York; Mrs. Hazel Harris, Administrative Assistant, AAI, Memphis; Treasurer Murray O. Rasberry, Delta Butane Gas & Fertilizer Co., Helana, Ark.; retiring President (now executive committeeman) Ralph H. Wooten, Mid-South Chemical Corp., Memphis; Executive Vice President Jack Criswell, AAI, Memphis.

Jack Criswell, executive vice president of the organization, delivered the staff report to the membership. Summarizing complaints about the past season, he mentioned the difficulties of application in various areas where the weather was extremely dry or wet at the wrong time; many considered selling out their businesses, he recalled, and decided to stay "in" too late to do any effective selling; their indecision, in turn, hurt sales for accessory manufacturers. He cited the damage done by price-cutting in many areas. Today, he emphasized, selling ammonia is a real sales job —and those who fail to recognize the challenge of this highly competitive market are doomed to a short future in the business.

For the Institute it was a good year, Mr. Criswell said; despite the loss of more than 60 dues-paying members to big-time expansion, AAI now has more dues-paying members than ever before. He pointed to the continued research on tank failure, and reported that study has turned toward the ammonia itself along with analysis of any contaminants that may be picked up in storage and transit.

He cited the regional and state meetings in which the AAI staff has participated and assisted this year, and reviewed the work of various committees. Viewing the job ahead, Mr. Criswell said that a list of 1500 ammonia outlets has been built up and mail solicitation for membership is already under way, but he called on present members to add their personal efforts to the drive.

An unscheduled report from the Education Publicity committee was the finale of the afternoon, with Chairman Joe S. Whittington (Olin Mathieson Chemical Corp., Baltimore) revealing recommendations that were to be presented to the Board. At the conclusion of the report Mr. Whittington — admittedly an "old hand" at the fertilizer business—offered a few words of advice to distributors who were present: Face facts, he said,—there is no

COMMERCIAL FERTILIZER STAFF PHOTOS—

1. Incoming AAI President Fred M. Stewart of Agricultural Ammonia Service, Santa Paula, Calif., and retiring President Ralph M. Wooten, Mid-South Chemical Co., Memphis.
2. Arthur Smith, Olin Mathieson Chemical Corp., Baltimore, and J. R. Adams, USDA, Beltsville, Md.
3. B. W. Knowles, Olin Mathieson Chemical Corp., Little Rock, and C. J. Chapman, Univ. of Wisc., Madison.
4. J. D. Charton, Arkansas Foundry, Little Rock, and Ed Gill, Mississippi Tank Co., Hattiesburg.
5. R. C. Singletary, Blakely Fertilizer Co., Blakely, Ga.; C. C. Murray, Univ. of Ga., Athens; John T. Phillips, Sr., and Jeff Davis of Southeastern Liquid Fertilizer Co., Albany, Ga.
6. Leonard Schrader and F. A. Geary, Standard Oil Co. of Ind., Chicago, and Herbert W. Stam, Stam's Ammonia Service, Watseka, Ill.
7. F. F. Cowart, Ga. Exp. Sta., Griffin, and Cooper Morecock, Nitrogen Div. Allied Chemical & Dye Corp., Atlanta.
8. Allen R. Brown Bernard & Leas Clarksdale, Miss.; R. I. Rankin, Bernard & Leas, Cedar Rapids, Iowa; and Fred Stewart, Agricultural Ammonia Service, Santa Paula, Calif.
9. M. L. Luther, Pollard Mfg. Co., Minneapolis, and Allen R. Brown, Bernard & Leas, Clarksdale, Miss.
10. W. J. Paden and Bruce Cloaninger, Clemson College, Clemson, S. C.; P. J. Bergeaux and J. R. Johnston, Univ. of Ga., Athens.
11. B. W. Smith, Agro-Vita, Minneapolis, and Clyde T. Marshall, Commercial Solvents Corp., New York.
12. Boyd Halverson, Okla. Liquid Fertilizer Service, El Reno, and J. H. Lanier, San Jacinto Chemical Co., Houston.
13. George W. Harden, DeSoto Chemical & Supply Co., Hernando, Miss., and C. W. Butler, Mississippi Chemical Corp., Yazoo City.
14. W. G. Neill, Canadian Hydrocarbons, Winnipeg, and W. G. Cook, Suburban Farm Service, Whippany, N. J.

short cut to success in this business; you've got to sell nitrogen to sell ammonia; encourage farmers on the "do it yourself" theme; follow-up after application each year, and sell the farmer on the idea that it has paid; urge him to get soil tests, for you may find there is some other limiting factor in his soil that will prevent full results from nitrogen; study his needs and methods, such as plant population; convince yourself that youve rendered him a service. Distributing ammonia, he concluded, won't make any man a Rockefeller but it can make him a good living if he does a good job.

Final business of the day was election of new directors (see separate item in this account) and selection of a 1958 convention site. Chicago won out in this balloting. Little Rock, selected last year, will be the scene of the 1957 meeting, with definite dates to be determined later.

Thursday morning's program was devoted to a symposium on "Pasture Fertilization and Improvement" featuring three experts from three different sections of the country.

George A. Rogler, USDA research agronomist from Great Plains Experiment Station at Mandan, N. D., led off with some new findings from his area. A summary of his remarks—preparation of which was shared by R. J. Lorenz, also a research agronomist at the station—follows:

"There has been and continues to be a great need for information on the use of commercial fertilizers on range lands of the Northern Great Plains. Because of the need for this type of information a study was initiated in 1951 at the U. S. Northern Great Plains Field Station at Mandan, North Dakota to obtain data on the effect of applying nitrogen as ammonium nitrate to native grass.

"Dry matter yields during the 1951-56 period were highly variable depending on the amount of rainfall. On the check plots, where no fertilizer was applied the yields ranged from 259 pounds per acre to 1247 pounds with an average of 748 pounds. With the application of 30 pounds of nitrogen per acre annually yields ranged from 504 to 2595 pounds per acre with an average of 1326 pounds. The range in yields where 90 pounds of nitrogen were applied each year was from 875 to 5062 pounds per acre with an average for the six years of 2271 pounds.

"This marked response in yields to nitrogen was obtained on soils that tested high in total nitrogen before the application of commercial nitrogen. The increase in yields was due mainly to the increase in number of plants and stimulated growth of western wheatgrass, a high yielding cool-season species. In 1956, after six years of annual applications of 90 pounds of nitrogen per acre, 83.5 percent of the vegetative cover was western wheatgrass compared to only 57 percent in the check plots. Blue grama, a low growing summer grass was greatly reduced in density by the shading effect of western wheatgrass.

"Nitrogen fertilizer applied to heavily grazed native grass improved the condition of the range at a much more rapid rate than complete isolation from grazing without fertilization. The use of nitrogen would appear to be a valuable tool along with other range management practices in the improvement of heavily grazed ranges. Increased production was obtained not only on heavily grazed native pastures but on properly grazed pastures as well.

"Significant increases in the percentage of crude protein in the herbage were obtained from the 90 pound application of nitrogen. Thirty pounds decreased the percentage protein in comparison to check plots in some years due to the stimulation of growth without sufficient nitrogen accumulation in the plants beyond the actual needs of the plants for growth.

"On the basis for the present day prices for hay and ammonium nitrate the increased yield due to either the 30 or 90 pound applications of nitrogen would not be economical. Actual beef gains were not obtained but it would appear that gains per acre due to these rates of nitrogen would be sufficient to more than pay for the fertilizer. Other advantages such as more rapid range improvement, lengthening of the grazing period and better distribution of livestock over the range should result from the use of commercial nitrogen.

"Results of this study indicate a great potential for more efficient production and increased return per acre by proper use of range fertilization in the Northern Plains where the major portion of the land is in grass."

Next was W. R. Thompson, pasture specialist for Mississippi Agricultural Extension Service. He told of the progress made in establishing and improving pastures through the mid-south and cited the potential that remains for nitrogen sales expansion for all types of crops. His advice to farmers is "if you don't intend to use nitrogen on pastures, don't bother to plant them."

Illustrating his points with selected film slides, he showed the miraculous changes brought about by fertilization and by the sod-seeding which he has helped so much to develop. "Today there is more specific information on using fertilizer on different crops than there has ever been," he said, and it is up to the fertilizer salesman to carry this to the farmer. "A fertilizer salesman today has come to be a service man."

"Personally," Mr. Thompson surmised, "I think the hope of the world in the future can easily be based on how much and how wisely we use fertilizer on our different crops."

Concluding panelist was Dr. D. R. Dodd of Hedgesville, W. Va., retired chairman of Ohio State University's Agronomy Group. He began by reminding his audience that "you can profit only as the farmer profits. In the long run it would be better that no sale was made than that the product sold be used in such a manner that it produces a loss rather than a profit. I am suggesting that the industries' farmer-contact men give more attention to a study of the farmer and his operation. Frequently, it seems to me, these men do not recognize the farmer's limitations and the limiting factors in his production."

In summary, Dr. Dodd made some pertinent observations and a prediction:

1. Grassland fertilization is profitable only to the degree to which the extra production can be profitably marketed. This depends upon the farm, the farmer, the livestock and the type of farm and livestock management.

2. Custom application of fertilizer to grasslands should be encouraged.

3. The return from pasture fertilization may be doubled or halved by the type of grazing management.

4. Fertilizer applications, especially of phosphorus and potash, should be more liberal at the periods of establishment and renovation.

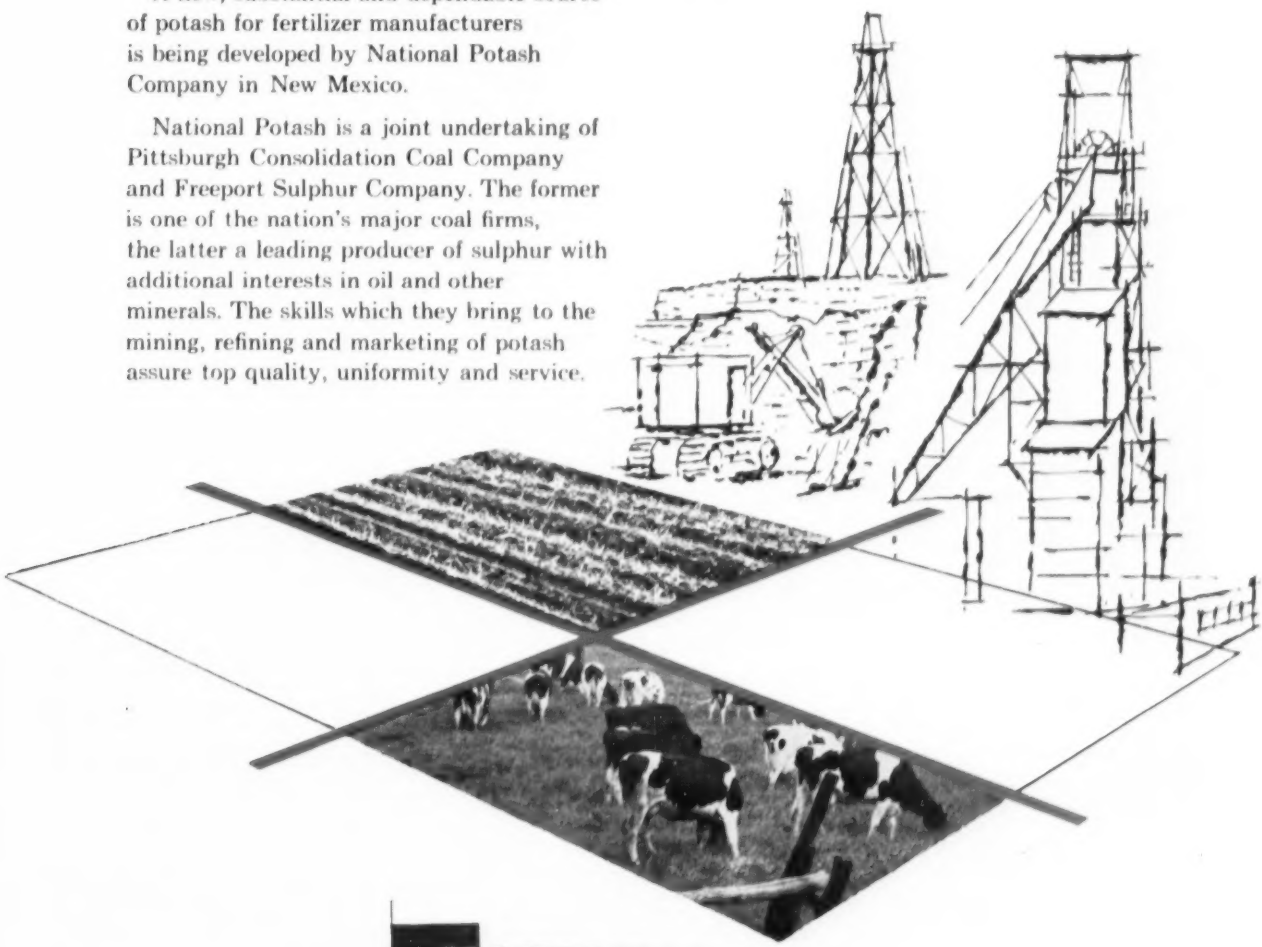
5. Top dressing of pastures with phosphate, potash and nitrogen separately or in combination, depending upon conditions, should be encouraged. It is easy, it is cheap, it is profitable.

6. Our present idea that legumes are our best source of nitrogen for grasslands may be in error in many situations. This concept developed

a joint venture in Potash

A new, substantial and dependable source of potash for fertilizer manufacturers is being developed by National Potash Company in New Mexico.

National Potash is a joint undertaking of Pittsburgh Consolidation Coal Company and Freeport Sulphur Company. The former is one of the nation's major coal firms, the latter a leading producer of sulphur with additional interests in oil and other minerals. The skills which they bring to the mining, refining and marketing of potash assure top quality, uniformity and service.



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when commercial nitrogen was limited and more expensive than at present.

7. The use of a small amount of nitrogen on grasslands with partial stands of legumes in order to supplement the nitrogen from the legume is of doubtful value. A better policy probably is to disregard the legume and apply the amount of nitrogen required to give the production desired.

8. Present rates of nitrogen fertilization in general use are inadequate, but heavier rates should be used only to give extra production when needed.

9. On dairy farms where high production per acre of pasture is required, high and frequent nitrogen applications accompanied by irrigation are likely to become more common.

Immediately after the morning session, delegates boarded special buses and were taken to the Georgia Agricultural Experiment Station at Griffin for a barbecue luncheon. Station Director F. F. Cowart welcomed them, and Dr. C. C. Murray, dean and director of Agriculture at the University of Georgia, added his comments. At the close of an application equipment demonstration staged by J. G. Futral, head of the station's Agricultural Engineering Department, the buses returned the groups to Atlanta.

Another business meeting was held Friday morning, last day of the convention. J. R. Adams, senior chemist for USDA's Fertilizer and Agricultural Lime Section at Beltsville, Md., presented some new data which he and Walter Scholl (also of the USDA section) have compiled. In slide film graphs, he showed breakdowns by regions of liquid nitrogen consumption, revealing some state tabulations which have not yet been released for publication.

The text of his message was this:

"The fertilizer program used in the United States and Territories in the fiscal year ended June 30, 1955 was 1,960,536 tons, almost triple the 701,070 tons used in 1946. Almost 60 percent was in the form of separate materials in 1955 compared to less than 50 percent in 1946.

"Ammonium nitrate has consistently supplied more direct application nitrogen since 1946 than any other individual material. Anhydrous ammonia became the second largest source in 1952, supplying 137,983 tons of nitrogen, and its use has continued to increase.

"By 1955 anhydrous ammonia was being used in Puerto Rico and every State except Maine, New Hampshire, Vermont, Massachusetts, and Rhode Island. The total consumption was 353,681 tons or 290,337 tons of nitrogen, an increase of more than 100 percent in the last 3 years.

"Nitrogen solutions, including aqua ammonia, also have risen in prominence in the last few years and Hawaii Puerto Rico and all but 11 States consumed 340,574 tons (84,979 tons N) in 1955. The increased use of anhydrous ammonia and other liquid sources of nitrogen has been possible because of the expansion of the ammonia industry.

"There were 9 domestic synthetic ammonia plants with an estimated annual production capacity of 377,000 tons of nitrogen previous to World War II. By 1957 this capacity will be 3,554,000 and there will be 46 plants with at least 1 in each continental area, except the Mountain Region."

Kenneth McFarland, educational consultant for General Motors, wound up the morning with an outstanding inspirational talk on "Human Factors in Human Relations."

Byron T. Shaw, administrator of USDA's Agricultural Research Service, led off the program at the final session. Speaking on "USDA Research," he related how research has paved the way for spectacular gains in yield by developing higher-yielding and better feed crops and cited specific examples scattered across the nation.

Research is also, he pointed out, helping to restore the balance in agriculture by developing new crops, developing new uses for established crops, and improving the quality of agricultural products so they can better compete for the consumer's dollar.

Due to the lag between discovery and the application of knowledge, he explained, research's role remains as one of long-range development, and it begins to pay off only when its findings come into use on the majority of the farms where they are applicable.

Much remains to be done, despite spectacular advances in recent years, Mr. Shaw emphasized, as less than a dozen of our 75 forage grasses have been improved in yield and quality through breeding. Work is in progress now on tall fescue, which animals often avoid perhaps because of its low nutritive value, or perhaps because of a toxic factor.

More study must also be devoted to irrigation and liming, to placement and time of fertilizer application, to liquid fertilizers, he concluded, and to band-seeding which has shown considerable promise of putting the plant food where it is most available to the growing plant, and also promise of helping the farmer avoid adherence to such a strict seeding date.

Max Fetty of Baton Rouge, public relations vice president for Delta Tank Mfg. Co., wrapped up the session with an amusing and informative discussion of selling through public relations.

On the final evening, the nitrogen producers entertained at a hospitality hour preceding the annual banquet.

Ammonium Phosphate-Nitrates Claimed Ready For Commercial Production

Charles H. Young, TVA's manager of Chemical Engineering, last month voiced an opinion that high-analysis ammonium phosphate-nitrate fertilizers are ready for large-scale production in the U. S. and that "considerable technical information regarding processes TVA has developed" is available to industry.

"We believe we have enough technical information concerning equipment and processes to guide others in starting production," Mr. Young said. "Several fertilizer companies have done experimental work on ammonium phosphate-nitrates but, so far as we know, there is no actual production in the country. We do not know whether any companies now are planning such production."

A Canadian company has been shipping a 27-14-0 product into the country.

"Because ammonium phosphate-nitrates can be made from numerous readily available raw materials and by a variety of processes, and because the products are concentrated and effective fertilizers, we believe there are opportunities for private firms in the production of such fertilizers," he stated. "This is particularly true since we have found it practical to make ammonium phosphate-nitrates in the TVA continuous ammoniator, which is becoming standard equipment in many fertilizer plants."

VORHES CHEMICAL CORPORATION GETS OUTSTANDING PERFORMANCE FROM UNION'S I & C BAGGER

"We wouldn't trade this machine for any piece of equipment we have in the plant"

Ends "rush season" production worries, brings about greatest savings, fertilizer executives report.

SOLVES RUSH SEASON SHIPPING PROBLEMS

"The UB-101 machine has proved to be more than adequate in every phase of performance."

P. L. Etheredge, Secretary-Treasurer
Etheredge Guano Company, Inc.
Augusta, Ga.

ELIMINATES ALL OVERTIME

"We were able to eliminate all overtime during the past two seasons, which I am convinced more than compensated us for the small cost of the baggers.

"The speed and accuracy of these units made the many thousands of tons we handled during the rush period a pleasure.

"One of the most significant features is the lack of maintenance. The amount we have expended would not exceed $25 for the past two years."

C. P. Belding, Superintendent
F. S. Royster Guano Company
Athens, Ga.

PRODUCTION UP 50%··· LABOR SAVINGS 33%

"Union's I & C Bagger has enabled us to increase production to 50 to 60 tons per hour, compared with 35 to 40 tons in the past, and we are able to do it with two men instead of three. Union's Bagger is as fast and efficient a bagger as I've ever encountered. Its performance has been little short of sensational."

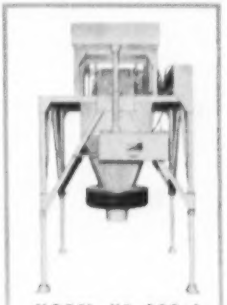
C. L. Durham, Plant Superintendent
Dixie Guano Co., Laurinburg, N. C.

F. Robert Kerrigan
Production Manager
Vorhes Chemical Corporation
Charles City, Iowa

"The I & C Automatic Open Mouth Bagger gives us one of the most accurate jobs of weighing, and is one of the easiest pieces of equipment we have to maintain. We have consistently maintained speeds of 22 bags per minute. In short, we wouldn't trade this machine for any piece of equipment we have in the plant."

Vorhes Chemical's experience is typical of many fertilizer manufacturers. More than 300 of Union's I & C Baggers have been installed in this industry during the past two years alone. This automatic and practically fool-proof high speed equipment usually pays for itself in full, through savings alone, in a remarkably short period of time.

We will be glad to demonstrate with actual figures based on recent fertilizer installations.



MODEL UB 100-A (Double Beam Scale) for accurate, high speed weighing of granular materials

NEW! SEND FOR UNION'S AUTHORITATIVE AND PRACTICAL "FERTILIZER PACKAGING WORK KIT"

Package Engineering Department
Union Bag-Camp Paper Corporation
233 Broadway, New York 7, N. Y.

Please send immediately your new "Fertilizer Packaging Work Kit" which includes a new calculator for figuring our bagging cost-per-ton. I understand there is no charge or obligation.

Name ..... Title .....

Company .....

Address .....

City ..... Zone ..... State .....

UNION'S I & C BAGGER

Automatic Weighing and Filling Machine for Open Mouth Bags

Manufactured by INGLETT & CORLEY, INC., AUGUSTA, GA.
Exclusive Sales Agents:
PACKAGE ENGINEERING DEPARTMENT
UNION BAG - CAMP PAPER Corporation
233 Broadway, New York 7, N. Y.

Southern Soil Fertility Group Holds First Annual Conference

Soil scientists and fertilizer industry representatives from thirteen southern states met at Atlanta November 2 for the first annual Southern Soil Fertility Conference.

Southern Regional Soil Research Committee, consisting of soil scientists from the thirteen southern land-grant colleges and the U. S. Department of Agriculture sponsored the conference in cooperation with the National Plant Food Institute.

A major feature of the meeting was discussion of the Soil Bank program (see page 26) and a question-and-answer period relating specifically to its effect upon the fertilizer industry. USDA's C. M. Cox was present to answer questions and to outline this program.

Howard T. Rogers, chairman of the Southern Soil Research Committee and head of the Alabama Polytechnic Institute, presided at the morning session and W. E. Colwell, assistant director of Research, N. C. State College, presided in the afternoon.

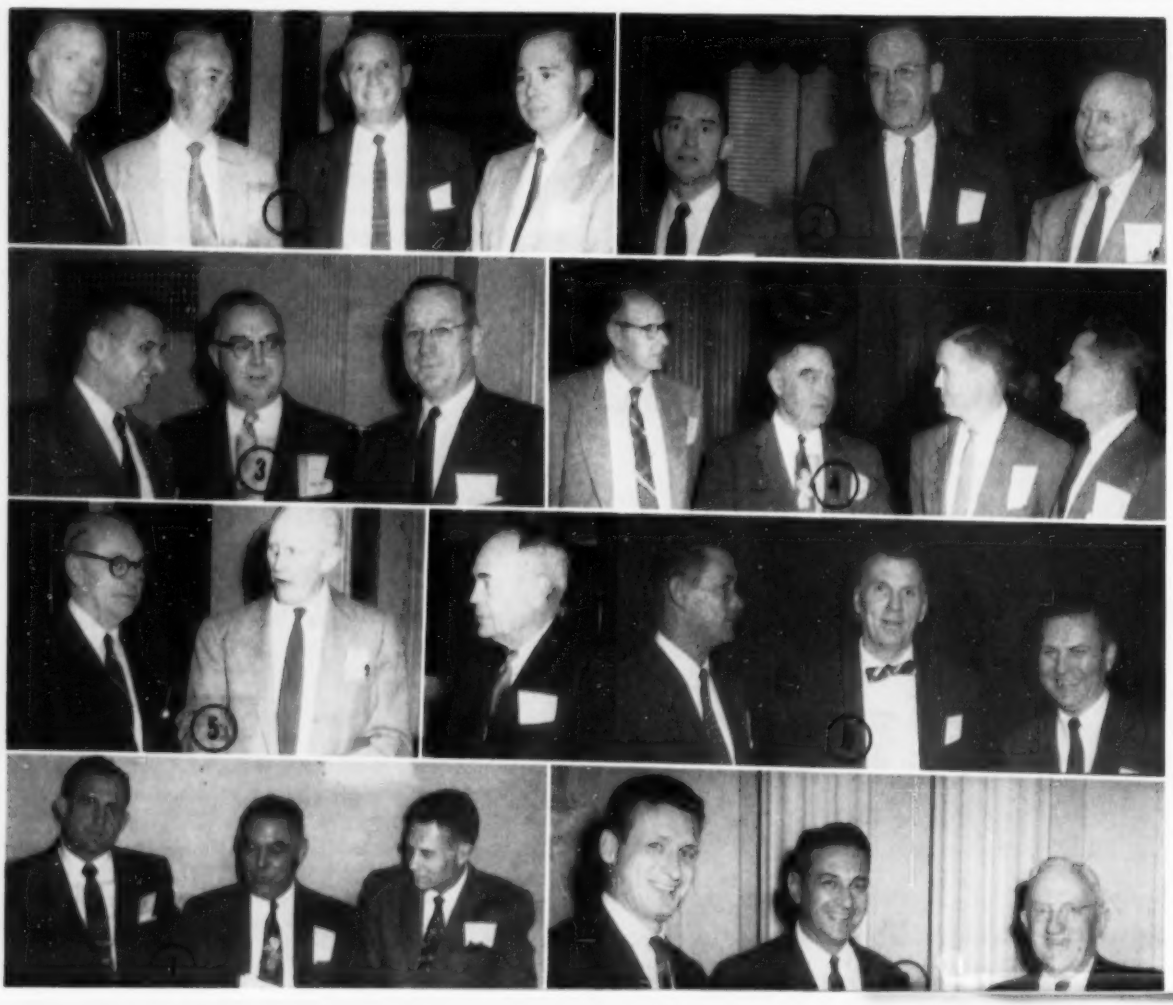
Opening remarks were made by Mr. Colwell, followed by C. T. Prindeville, NPFI president. Other morning speakers were:

L. B. Nelson, head, Eastern Soil and Water Management Section, USDA, on "Off-Season Fertilizer Potentials in the South" and W. R. Thompson, pasture specialist, Mississippi State College, on "Two Acres of Pasture on One Acre of Land."

In the afternoon, M. S. Williams, chief agricultural economist of the Institute, spoke on "Fertilizing and Liming for Most Efficient Crop and Livestock Production." He was followed by J. W. Fitts, head, department of Soils, N. C. State College and Frank Boyd, agronomist for Virginia-Carolina Chemical Corp.

(Continued on page 45)

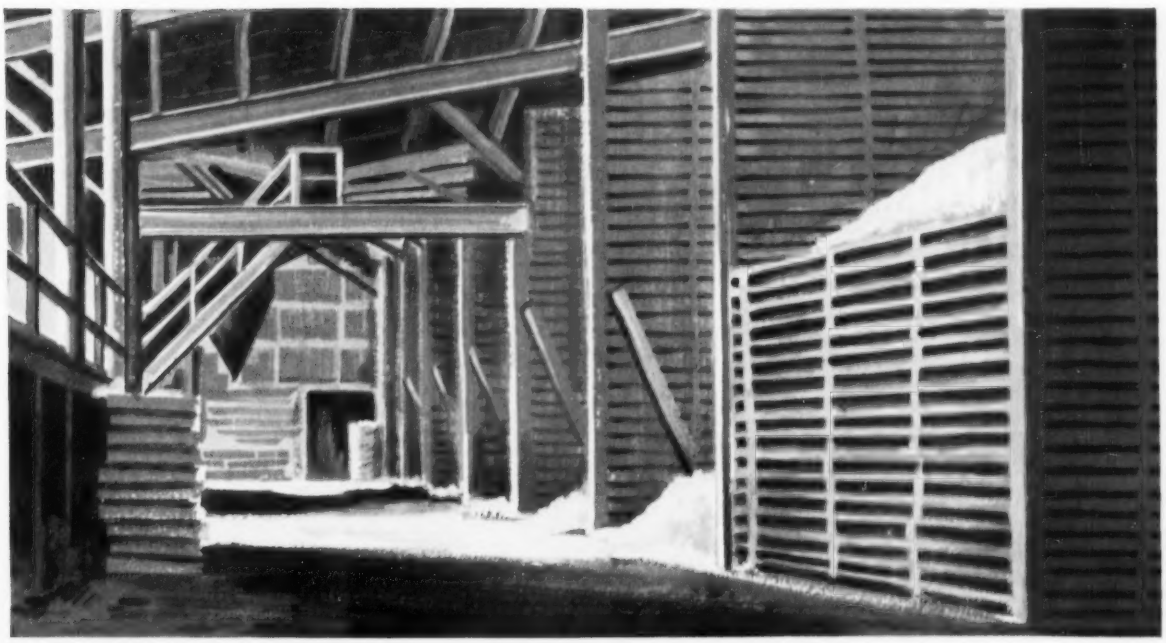
1. H. B. Mann, American Potash Inst., Washington; J. Fielding Reed, American Potash Institute, Atlanta; W. B. Porterfield, National Potash Co., New York; Douglas Blocker, National Potash Co., Greensboro, N. C.
2. W. H. Garman, NPFI, Washington; Bruce D. Cloaninger, Clemson College, Clemson, S. C.; K. D. Jacob, USDA, Beltsville, Md.
3. Ed Kapusta, U. S. Potash Co., New York; John Hall, Potash Co. of America, Washington; Paul Truitt, NPFI, Washington.
4. Dale Hinkle, University of Arkansas; W. R. Thompson, Mississippi Ag. Ext. Service, State College; C. Dale Hoover, Mississippi State College; W. H. Garman, NPFI, Washington.
5. B. F. Sutherland, Armour Fertilizer Works, Atlanta; K. D. Jacob, USDA, Beltsville, Md.; Charles D. Goodale, Commercial Solvents Corp., Terre Haute, Ind.
6. J. P. Champion, Jr., Albany Warehouse Co., Albany, Ga.; Raoul Alstetter, NPFI, Washington; Gordon Cunningham, Tennessee Corp., Atlanta.
7. Russell Coleman, NPFI, Washington; W. R. Thompson, Mississippi Ag. Ext. Serv., State College; C. T. Prindeville, Swift & Co., Chicago.
8. D. J. Stark Escambia Chemical Corp., Pensacola, Fla.; Mercer Rowe, Ashcraft-Wilkinson Co., Atlanta; Frank Boyd, Virginia-Carolina Chemical Corp., Montgomery, Ala.



Make sure it stores till spring

This time of the year, when you're busy moving inventory to warehouses or dealers, ask yourself this question:

"Have I done everything possible to make sure my mixed goods will store until spring?"



Consider ammoniation solutions. The type you use can improve the condition of your product and its storing qualities. Curing can be improved and bag set eliminated by your choice of solution.

Here's where the *complete* line of Sohiogen solutions can help with its wide choice of characteristics for better manufacturing control . . . plus special solutions with the condition-improving benefits of urea nitrogen.

The man from Sohio is trained to help you select the exact solution to best fit your needs. And Sohio's technical services are available whenever you need them.

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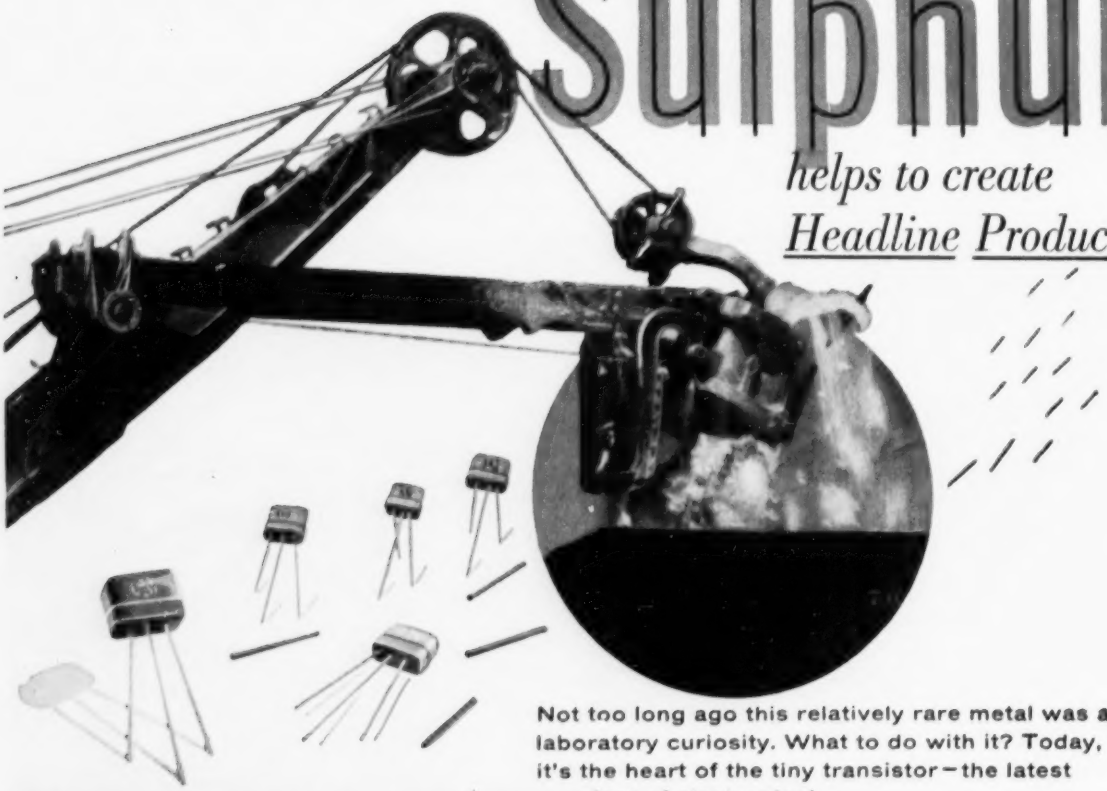
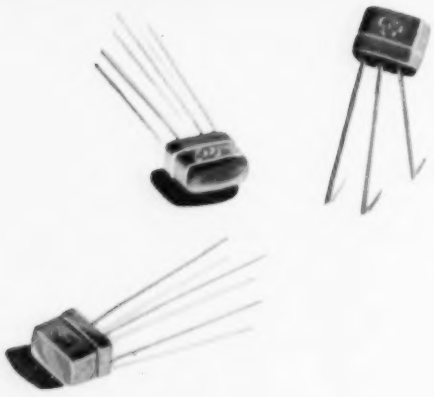


GERMANIUM



Not too long ago this relatively rare metal was a laboratory curiosity. What to do with it? Today, it's the heart of the tiny transistor—the latest giant of electronics!

What's the connection between Sulphur and Germanium?

There are two, in fact. One is man-made, involving the routine leaching of Germanium ores with Sulphuric Acid prior to tetrachloride distillation. The other takes advantage of a peculiar property of the natural mineral, Germanium Sulphide. This mineral can be volatilized and then sublimed, providing an effective method of separating the Germanium from gangue material. The process is called "Concentration of Germanium by Sulphide Sublimation".

Again Sulphur, through its major derivative, Sulphuric Acid, and a natural sulphide play an important role in our ever-expanding economy. It is difficult to find many items in the broad chemical-metallurgical field that do not somewhere along the production line make use of Sulphur or a derivative.

Texas Gulf Sulphur Co.

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Sulphur Producing Units
- Newgulf, Texas
- Moss Bluff, Texas
- Spindletop, Texas
- Worland, Wyoming

CF Staff Photos from First Annual

Southern Soil Fertility Conference

1. L. B. Nelson, USDA, Washington; Howard T. Rogers, Ala. Poly. Inst., Auburn; M. S. Williams, NPFI, Washington.
2. J. Ralph Johnston, Ga. Ext. Serv., Athens; J. E. Nunnally, Cotton Producers Assn., Atlanta.
3. Lloyd Seatz, U. of Tenn., Knoxville; A. A. Nikitin, Tennessee Corp., East Point, Ga.
4. Russell Coleman, NPFI, Washington; C. M. Cox, USDA, Washington.
5. H. F. Perkins, U. of Ga., Athens; Bill Seay, U. of Ky., Lexington.
6. Bill Ritnour, NPFI, Washington; F. W. Atkinson, International Minerals & Chemical Corp., Hartsville, S. C.
7. R. P. Thomas, International Minerals & Chemical Corp., Chicago; F. B. Smith, U. of Fla., Gainesville.
8. Fred McNatt, Allied Chemical & Dye, Nitrogen Div.; W. D. Barton, Tennessee Corp., East Point, Ga.
9. J. H. Paul, Escambia Chemical Corp.; Pensacola, Fla., Tom Nixon, Asheraft-Wilkinson Co., Atlanta.
10. W. E. Colwell, N. C. State College, Raleigh; Howard T. Rogers, Ala. Poly. Inst. Auburn; J. W. Fitts, N. C. State College, Raleigh.
11. Bill Nichols, Sylacauga Fertilizer Works, Sylacauga, Ala.; Clarence Wilson, Ala. Poly. Inst., Auburn.
12. M. B. Sturgis, Louisiana State University, Baton Rouge; Charles Summerour, American Potash Inst., Auburn, Ala.
13. James A. Naftel, Pacific Coast Borax Div., Auburn, Ala.; George Stanford, TVA, Wilson Dam, Ala.

(Continued from page 42)

and president of Alabama Soil Fertility Society who made a "Grade-Ratio Committee Report," and Mr. Cox of USDA.

A question-and-answer period, with Mr. Colwell as moderator, concluded the conference.

Dr. L. B. Nelson said without qualification that "pastures and hay lands constitute the most neglected segment of our agriculture."

He said that "the potentials for fertilizer on pastures and hay lands during the summer and fall months are particularly great."

Dr. Nelson pointed out that "soils are in better condition in the fall of the year to accommodate application equipment," adding that "often in the spring of the year it is not possible to get on the fields at the right time."

"The farmer must utilize his highest cost item—namely labor—efficiently," he emphasized. "In the spring, labor loads on the farm are at their peak. For this reason all operations possible need to be taken care of in advance."

The USDA scientist pointed out that all too frequently small grains and winter cover crops are not adequately fertilized at the time of planting. "Applying the proper amount of fertilizer at the time of planting is extremely important, especially if these crops are to be grazed," Dr. Nelson said.

Another advantage he stressed is that "if farmers purchase their fertilizers early, they can be sure of getting the analyses required as a result of soil tests."

W. R. Thompson told the conference that "it pays to band seed and band place fertilizer on most of our pasture grasses, clovers and legumes."

"Sod seeding is a method of pasture building and maintenance," Mr. Thompson pointed out. "It offers an excellent means of controlling soil erosion, plus the growing of winter grazing crops on permanent sods without any damage to the next year's sod growth. This is not a new program. It has been used over a period of ten years and has proved its worth in pasture building, especially the winter grazing phase of it.

"Farmers do not like to break their sod pastures. By using the sod seeding method, it is not necessary to break the pasture to plant and fertilize or interplant cereals in sod for special grazing period.

Estimated Percentage of Tonnage of Ratios Sold within States

Ratio	Ala.	Ark.	S.C.	N.C.	Fla.	Ga.	Ky.	Okla.	Tenn.	Tex.	Va.
0-1-1	5	2	7	0.8	1.6	6	4	1	3	—	6
0-1-2	5	5	3	0.9	0.8	2	2	—	1	—	3
0-2-1	5	—	—	—	—	1	0.5	1	1	1.1	0.3
1-0-1	—	2	1	2.0	5.0	6	—	—	1	—	0.8
1-1-1	5	20	0.5	2.3	23.3	1	10	2	3	10	6.0
1-2-1	—	30	8.0	18.4	12.9	8	—	38	1	61	9.6
1-2-2	—	15	3	15.4	15.2	10	10	2	55	2	20.0
1-2-3	—	20	3	0.2	—	—	20	—	3	—	—
1-3-2	—	—	4	16.5	4.5	—	18	—	15	—	11.0
1-3-3	60	—	5	15.9	3.8	50	—	—	—	—	7.7
1-4-4	—	3	13	—	0.4	—	18.5	1	7	2.5	—
1-4-2	10	—	—	—	—	—	—	—	3	—	1
1-0-3	—	—	0.5	1.3	?	—	—	—	—	—	0.3
1-3-6	—	—	?	1.3	—	—	—	?	?	—	—
0-1-3	—	—	—	0.5	0.5	—	—	—	1	—	—
1-1-2	—	2	—	0.8	2.4	—	—	—	—	—	—
1-2-0	—	1	—	—	—	—	—	6	—	10	—
2-1-1	—	—	—	—	1.8	—	—	1	—	1	—
1-3-1	?	?	?	?	?	?	?	?	?	?	
1-6-6	—	—	—	10.9	—	—	—	—	—	—	29.0
Total percentage	90	100	48	87.2	72.2	84	83	52	94	86.6	94.7

Summary of State Practices and Trends

Tabulation of responses to the following questions:

Question 1. Are soil test recommendations given as pounds N-P_2O_5-K_2O per acre? (With or without fertilizer grade suggested).

Question 2. Are the general fertilizer recommendations for the state or a given area presented as pounds N-P_2O_5-K_2O per acre?

Question 3. Is there a trend toward an increase in use of fertilizer materials such as superphosphate and nitrogen?

Question 4. How is the trend affecting sale of mixed fertilizer?

Question 5. If a list of fertilizer ratios with a minimum grade should be accepted throughout the southern region, how many multiples of this ratio should be permitted above the minimum grade?

STATE	Answers to Question				
	1	2	3	4	5
Ala.	yes	yes	N, yes; P_2O_5 & K_2O, no	no effect	no restriction
Ark.	yes	yes	yes	down some; depends on price	no restriction
S.C.	yes	yes	N, yes		no restriction
N.C.	yes	yes			no restriction
Fla.	yes	no	yes	none	one
Ga.	no	no	no		no restriction
Ky.	yes	yes	no	toward mixed fertilizers	no restriction
La.	—	—	—		—
Miss.	no	yes	no	no effect	no restriction
Okla.	yes	yes	yes	no effect	two
Tenn.	yes	no	no	no effect	no restriction
Tex.	yes	yes	yes	materials increasing	no restriction
Va.	no	yes	yes	little, if any	limited to whole % points

"The sod seeding principle has almost year-round use in the pasture program. Planting, using this principle, starts in March in seeding Dallis, Bermuda, Bahia, annual lespedezas and Sericea lespedeza. Following the harvest of small grain, hay or silage in the spring, Sudan, millet, sorghum and grain sorghum are planted, putting down fertilizer at the same time without losing the moisture in the early summer which often happens when land is broken.

"Early and late summer plantings of Sudan and millet can be made for summer grazing. Early in the fall, or just about the time pastures become dormant, cereals and ryegrass can be interplanted in the sod using a special type sod seeder.

"Cover crops can be planted on row crop land with the sod seeder and not disk it down and leave it subject to erosion during the winter."

Dr. M. S. Williams stated that "acres placed in the 'soil bank' can be enhanced in value with sound land management including the application of needed plant food."

"We must not let excess supplies of some farm products blind us to the continuing and pressing need for increasing efficiency in agriculture today," Dr. Williams said. "With the price-cost squeeze still a problem, more than ever before we must avail ourselves of every opportunity to lower the per unit cost of production.

"Farmers should study the 'soil bank' provisions in light of their own farming operations and they should adapt to their farms those provisions which improve their overall economic wellbeing.

"The 'soil bank' has many features particularly adaptable to southern farming. And, if these practical features are used in farm planning in the South, they can result in a better balanced agriculture." (See page 26 in this issue for NPFI's full analysis of the soil bank and its effect on the fertilizer industry.)

Dr. J. W. Fitts said that, during the past ten years, soil testing has become "an important tool in determining fertilizer requirements for different soils and crops."

"Field experiments throughout the South, along with summaries of soil test results, have given valuable information about the fertility status and needs of the soils in the various states," he added.

"Southern states were among the first to adopt the practice of bolstering crop yield through use of commercial fertilizers," Dr. Fitts

IN SUGAR BEETS, POTASH-ENRICHED FERTILIZERS MAKE THE DIFFERENCE

with sufficient potash

without sufficient potash

Today's experienced farmer knows the importance of replenishing his soil regularly with balanced fertilizers. Whether he grows sugar beets or soybeans, good soil—through balanced fertilizers—makes the difference. And it's the potash in these fertilizers that protects crops from plant diseases, improves quality and yield.

USP's high-grade muriate of potash has the highest K_2O content and is free-flowing and non-caking—important advantages in the manufacture of these modern fertilizers which help American farmers to better crops and better incomes.

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HIGRADE MURIATE OF POTASH 62/63% K_2O

GRANULAR MURIATE OF POTASH 60% K_2O MIN.

Fertilizer ratios and minimum grades suggested most often by each state in Southern Region

(Does not necessarily include grades on present grade list or recommended in 1956)

Rstio	Ala.	Ark.	S.C.	N.C.	Fla.	Ga.	Ky.	La.	Okla.	Tenn.	Tex.	Va.
0-1-1	0-14-14	0-14-14	0-14-14	0-14-14	0-14-14*	0-12-12	0-12-12	0-14-14	0-14-14	0-20-20	0-14-14	0-14-14
0-1-2	0-10-20	0-10-20	0-10-20	0-10-20	0-10-20	0-10-20	0-10-20	0-10-20	No	0-10-20	No	0-10-20
0-2-1	0-16-8	No	No	No	0-16-8	0-16-8	0-16-8	0-16-8	0-16-8	0-20-10	0-16-8	0-16-8
1-0-1	14-0-14	14-0-14	14-0-14	No	14-0-14*	14-0-14	No	No	No	14-0-14	No	14-0-14
1-1-1	8-8-8	8-8-8	8-8-8	8-8-8	8-8-8*	8-8-8	8-8-8	8-8-8	8-8-8	8-8-8	8-8-8	10-10-10
1-2-1	No	5-10-5	5-10-5	6-12-6	6-12-6*	5-10-5	No	5-10-5	5-10-5	5-10-5	5-10-5	5-10-5
1-2-2	No	5-10-10	5-10-10	5-10-10	5-10-10	5-10-10	5-10-10	5-10-10	5-10-10	6-12-12	5-10-10	5-10-10
1-2-3	No	4-8-12	4-8-12	4-8-12	5-10-15	5-10-15	5-10-15	No	No	5-10-15	5-10-15	No
1-3-2	No	No	3-9-6	No	4-12-8	4-12-8	4-12-8	4-12-8	No	4-12-8	4-12-8	4-12-8
1-3-3	4-12-12	No	4-12-12	4-12-12†	4-12-12†	3-9-9	No	4-12-12	No	No	No	4-12-12
1-4-4	No	3-12-12	3-12-12	No	No	No	3-12-12	3-12-12	3-12-12	3-12-12	3-12-12	No
1-4-2	4-16-8	No	No	No	No	4-16-8	No	No	No	4-16-8	No	4-16-8
1-0-3	No	No	8-0-24	8-0-24	8-0-24	No	No	No	No	No	No	8-0-24
1-3-6	No		3-9-18	3-9-18	No				3-9-18	3-9-18	No	
0-1-3	No	No	No	0-9-27	0-9-27*	No	No	No	No	0-9-27	No	No
1-1-2	No	6-6-12	No	6-6-12	6-6-12	No	No	No	No	No	No	No
1-2-0	No	7-14-0	No	No	No	No	No	No	8-16-0	No	10-20-0	No
2-1-1	No	No	No	No	12-6-6	No	No	No	12-6-6	No	10-5-5	No
1-3-1	No			No	5-15-5*				4-12-4	No	4-12-4	
1-6-6	No	No	No	2-12-12	No	No	No	No	No	No	No	2-12-12
1-1-0	No			No	No			10-10-0	10-10-0	No	10-10-0	No
1-2-4	4-8-16			No	No					No	No	No
1-1-3	No			No	6-6-18		6-6-18			No	No	No
2-2-1	No			No	No				10-10-5	No	10-10-5	No
0-3-1	No			No	0-15-5					No	No	No
1-3-4	No		3-9-12	No	3-9-12*					No	No	No
2-3-1	No		6-9-3	No	No					No	No	No
2-5-3	No		4-10-6	No	No					No	No	No
3-5-2	No		6-10-4	No	No					No	No	No
3-4-3	No		6-8-6	No	No					No	No	No
3-4-6								6-8-12				

*Lower minimum grades would be permissible where addition of minor elements is recommended.
†3-9-9 is recommended for tobacco.
Mississippi—Recommended only P_2O_5 to K_2O ratios of 1:1, 2:1, and 2:3 or 1:1, 2:1, and 2:2.

continued. "Through the years a great multitude of grades were offered for sale and recommendations differed from one state to another. In order to protect both the consumer and manufacturer, some states passed laws relative to the sale of mixed fertilizers. Differences still exist, however, in recommendations across state lines.

"In 1954, a subcommittee was appointed by the Southern Soil Research Committee to survey the use of fertilizers in the South to determine what fertilizer ratios were needed. After studying all the information available, agronomists in the various states found that a surprisingly few ratios are necessary to take care of all soil conditions within the states.

"Selecting a list of fertilizer ratios with a minimum grade in each ratio was suggested by the subcommittee. States may select all of the ratios on the list or only part for their official recommendation. Of those selected, however, the minimum grade permitted would be the same throughout the southern region, while the number of grades permitted above the minimum grade would be the responsibility of each state. Only ratios with whole numbers were recommended by the committee."

Frank E. Boyd told the group: "The greatest present day need in the agronomy-plant food field is the unification and simplification of fertilizer ratios and the matching of grades. Agronomists and industry people alike are interested in this goal, and farmers will greatly benefit from its application."

Voluminous data reveal the need for only three basic fertilizer ratios and matching grades for most of our soils and crops namely:

Varying nitrogen with equal P-K; varying nitrogen with high P-low K; varying nitrogen with low P-high K.

Due to the relatively high requirement of many crops for nitrogen and to varying rates and methods of application it is not always convenient to apply total needs of this element in mixed goods so "varying nitrogen" is suggested as a part of the general ratio pattern set forth above. All the nitrogen does not team up directly with the P and K since it may be applied before at time of, or after planting or in a combination of these methods to better fit in with farm management practices. Truly, the use of nitrogen entails varying procedures.

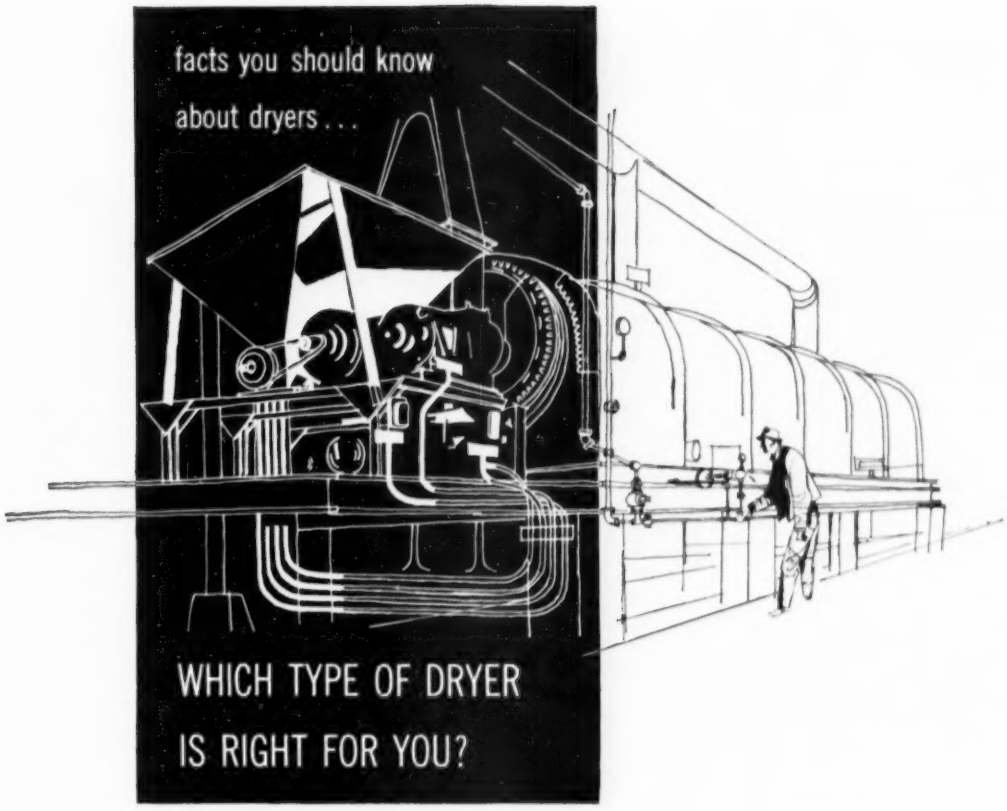
The Grade-Ratio Subcommittee of the Southern Regional Soil Research Committee has done a marvelous job of analyzing and coordinating the recommended grade lists from the regional states, but such grade lists do not permit unification and simplification so long as we include so many "varying nitrogen" percentages in the N-P-K ratios.

The nitrogen percentages in the three-way (N-P-K) ratios are quite variable, fluctuating widely from zero upward, while P and K needs are more stable and easier to establish and maintain. It is suggested, therefore, that we begin the program of unification by first setting up simple 1-1, 2-1, and 1-2 P-K ratios.

A study of all the ratio research data reveals the practical need for only three basic P-K ratio-grade groups. The decision to set up these groups must have been handed down by the agronomists many years ago, for since consumption statistics were first recorded industry has produced only ratio-grades that approximate these basic groups.

These basic ratio-grade groupings are the result of many years of field research from relatively few points in large soil areas and at best gives us only general fertilizer recommendations, so for specific or prescription recommendations we must

(*Continued on page 71*)



For over 55 years, Louisville Dryers have been solving industry's drying problems and effecting marked economies. The following is intended as an introduction to selecting the right type of dryer.

Q. *What types of dryers are there?*

A. Many types. They can be classified in two basic categories, namely, batch type and continuous.

Q. *What is proper application of the continuous type?*

A. Where large enough capacity is required to make savings in labor, space, and fuel advantageous.

Q. *What are some other advantages of the continuous type?*

A. Uniform quality of dried product. Lower drying cost.

Q. *What types of continuous dryers are most used?*

A. Rotary, Conveyor, Flash, Spray, Atmospheric Drum.*

Q. *Do all of the above types handle the same kind of material?*

A. No. While they discharge a dried solid, Spray and Drum Dryers are fed with a liquid. (Liquids and thin slurries can be handled in the other types by means of special designs or auxiliary equipment, but seldom are).

Q. *How can I be sure of getting the right type of dryer for my operation?*

A. Louisville engineers start by surveying your needs. Then, after considering the pertinent factors, they make recommendations for dryer type, heating medium, etc. Their recommendations can be proved by practical drying tests in General American's pilot plant. Your Louisville Dryer is then designed and built to suit your particular purpose and to fit your individual needs.

Q. *How can I investigate the matter in greater detail?*

A. Call in a Louisville engineer. No cost or obligation.

*Discussions to follow will deal with the subject in more detail.

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GENERAL AMERICAN TRANSPORTATION CORPORATION

Dryer General Sales Office: 139 So. Fourth Street, Louisville 2, Kentucky
Eastern Sales Office: 380 Madison Avenue, New York 17, New York
In Canada: Canadian Locomotive Company, Ltd., Kingston, Ontario, Canada
General Offices: 135 S. La Salle Street, Chicago 90, Illinois

REPORT CFA MEETING

Jack Baker, Bandini Fertilizer Co., Los Angeles, was elected president of the California Fertilizer Association at the organization meeting of the new Board of Directors during the 33rd Annual Convention Nov. 12 at Coronado, California. He replaces William E. Snyder, Wilbur-Ellis Co., Los Angeles, who served during 1956.

500 persons were in attendance from all over the country, and from Canada as well. Other officers elected to serve with Baker during 1957 are William G. Hewitt, Berkeley, vice president; M. M. Stockman, San Francisco, secretary; Howard H. Hawkins, Glendora, treasurer; and Sidney H. Bierly, San Marino, general manager.

The members, at their business meeting, elected these four Directors to serve for three years: Baker, Los Angeles; Lowell W. Berry, Oakland; V. A. Frizzell, Salinas; and Earl R. Mog, Stockton. John C. Anderson, Bakersfield, and John N. Williams, Chula Vista, were elected to the Board for one year terms, and Arthur W. Mohr, Richmond, for a two year term. Others serving on the Board of Directors are Fred R. Bryant, Shafter; Hawkins; Hewitt; Stockman; and Snyder.

Elmer Wheeler, Dallas, Texas, sales promotion expert, told the delegates of five keys to successful salesmanship, which he called "Wheelerpoints." Elaborating on the first point, "don't sell the steak, sell the sizzle," he said that hidden in whatever is offered for sale are features which have human appeal often overlooked in their presentation to the prospective purchaser, which he called "invisible sizzles." As an example, he suggested that people will buy a cheese because its "tang" was temptingly described, or the "crunch" in the cracker, the "whiff" in the coffee, and the "pucker" in the pickle.

He pointed out that in selecting a greeting card, quality of paper is often secondary to the sentiment printed on it, and insurance policies, stocks and bonds are sold on their surety rather than the paper on which it is explained. He said when a person hears, sees and smells the sizzle in a steak, it deals a triple blow to the emotions, and he will buy the steak that sizzles rather than the cheaper hamburger which lies fizzling on the platter.

Point number two is "don't write, telegraph." Wheeler said the first ten words will make or break a sale. If they aren't the right words, the next 10,000 will remain unheard. As examples of the proper approach he suggested "This shingle can never burn—it's asbestos!" "You can't jumble the keys on this typewriter," and "This policy is your vacation to Europe at 60." This type of approach will capture interest and get the sale under way, he said. The good salesman doesn't hem and haw, stammer and stutter. He speaks with surefooted straightforwardness, in fast-clicking sentences. "Canned sales talks" which sound mechanical should be avoided, but planned talk, filled with "sizzles" with known selling value are important to success.

"Say it with flowers" is step three. He said this consists of sprinkling the sales talk with showmanship. "The telegram all by itself isn't half as impressive as when the Western Union boy hands the lady the flowers." He suggested that each listener "say it with flowers" in his own business. For example, when the grocery clerk says the cheese is fresh and snappy, and hands the customer a sample bite, that is showmanship. When the broom salesman says the bristles last long, it is showmanship when and if he bounces it up and down to prove the point. He suggested that the salt and pepper of showmanship be sprinkled throughout all sales presentations, to prove points being made. This technique keeps the eyes and ears of the customer wide awake.

The fourth step suggested by Wheeler was "don't ask if—ask which." When on the point of closing a sale, he said to always give the other person a choice between "something" and "something else," never just something alone. Rather than asking "Well, think you'll buy the chairs?," the question should be "Which colors do you prefer?" — "What style do you like?"—"How many would you need?" He said the question "Which night may I have out, dear?" is far more apt to produce desired results than "May I go out tonight, dear?" When offered a choice between two things, the customer is forced to decide which he wants. This approach encourages him to buy something.

The final step, number five, "watch your bark," means that the tone of voice reaches out to the heart while the words themselves are touching the brain of the prospect. He advocated backing up words with smiles or "smile tones." The cigar store Indian never sold a cigar because his smile was painted on and he lacked a human voice. All he did was attract you into the store, where a bright young fellow said, "These cigars won't unravel in your mouth while smoking!" The manner in which you say what you say is important, he said.

Dr. Philip Neff, Director, Industrial and Governmental Economics Research, Planning Research Corporation, Los Angeles, told the delegates of the importance of their knowledge of the future in the conduct of their own businesses. He pointed out that the capital requirements in the fertilizer industry are unusually high, and that it is impossible for a firm to rapidly adjust its plant size to market conditions. The industry is highly seasonal, with about 75% of fertilizer use between January and June, which means that producers and distributors must have considerable excess storage capacity.

Differential capital equipment and associated differences in technology have a tremendous effect in the operating experience of fertilizer producers, he said. Technology is changing rapidly in this industry, the speaker said, which makes it necessary for producers to constantly adapt themselves to changing markets and changing methods. Those who fail to make proper adaptation will ultimately fail, while those who adapt themselves best to these changing conditions, and even anticipate them, will be most successful, he said.

M. E. McCollam, American Potash Institute, Inc., San Jose, and Chairman of the Association's Soil Improvement Committee, outlined the program of the Committee during the year just ending, and as projected for 1957. He stressed the importance of getting information to the farmer as to the economic advantages which accrue from proper use of fertilizer.

He pointed out that the industry and his Committee have long supported and conducted research on many phases of soil fertility and plant nutrition. The Committee has

approved a contribution of $4000.00 toward a total capital investment

vis, the panel consisted of George Monkhouse, Vice President, Shell

sible an efficient operation, including fertilizers, pesticides, and types

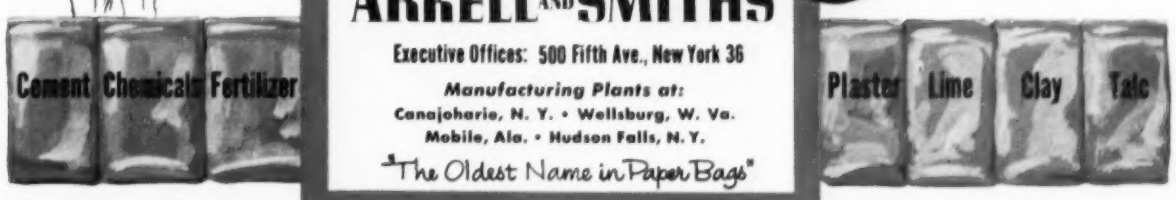
here's the Biggest News in the Fertilizer Industry

This revolutionary multi-wall is a real advancement in the science of bag closure. Unlike ordinary multi-wall pasted valve bags, the Arkell & Smiths "Step-Flex" Bag is triple-sealed top and bottom to eliminate sifting of fine materials. The plies forming the multi-wall construction are staggered on the ends, and each ply on one side of the bag is pasted to the corresponding ply that it overlaps on the opposite side of the bag . . . at both top and bottom.

This improved construction forms a positive sift-proof seal and actually makes the top and bottom of the bag even stronger than the walls!

Since the size of the orders for this new bag are increasing daily, we recommend that you let us know your requirements immediately! Write, wire or phone today.

P.S. There is no upcharge for the triple-sealed "Step-Flex" Bag.



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Pictures made at the recent Middle West Soil Improvement Committee meeting:

Smith Agric. Chem. Co.
16. F. N. Calvin, Farmers Union Exchange Co., D. A. Williams,

approved a contribution of $4000.00 toward a total capital investment of $13,000.00 required for lysimeter equipment with which research can go forward at the University of California, Riverside, on long-time effects of different fertilizers on four representative California soils. It has also donated during the year a small tractor with precision application equipment to the Vegetable Crops Department of the University at Riverside, for study of rates of application and placement of fertilizers on vegetable crops.

He reported wide acceptance during the year of the Committee's Western Fertilizer Handbook by the industry, farmers, and official workers all over the world. A series of workshops on soils, plant nutrition, and fertilizer use will be sponsored in early 1957 by the Committee, based largely on the text of the handbook, he said. In addition, an informational pamphlet on western methods of fertilizer application will be prepared for distribution. A visual aids program is being rounded out, which should assist the industry and its salesmen materially in doing a better job for agriculture. The Fourth Annual California Fertilizer Conference, held at Riverside, was an outstanding success. Essay contests, scholarships, and student loan funds have been other Committee features.

He announced that the Fifth Annual California Fertilizer Conference will likely be held on the campus of Fresno State College, Fresno, in April of 1957. An outstanding program is being developed, he said.

Employment by the Soil Improvement Committee of an agronomist is being considered, with a target-date set for early 1958, he concluded.

James M. Quinn, Chairman of a special Committee working with the University of California, bankers, and other crop production loaning agencies reported that the text for an informational brochure was developed during the year, for the use of bankers and their farmer clients. Some loose ends remain to be tied together, he said, before it can be published. He said the National Plant Food Institute is cooperating in the project.

A most interesting discussion developed during a panel program on the subject "Some Aspects of Fertilizer Industry Economics," which was the theme of the Convention. Moderated by Dr. J. E. Knott, Chairman, Department of Vegetable Crops, University of California, Davis, the panel consisted of George Monkhouse, Vice President, Shell Chemical Corporation, San Francisco; Ned Lewis, Vice President, Wilbur-Ellis Company, Los Angeles; J. Earl Coke, Vice President, Bank of America, San Francisco; and Dr. Neff.

The concensus was that established mixers and distributors, together with their plants and storage facilities, should be utilized to the fullest by those who manufacture fertilizer materials, to insure their most efficient marketing. The alternative would be to ignore the years of community background of these people, their knowledge of soils, crops, credit risks, etc., and establishing at some expense, duplicate distribution facilities, which would take years to develop the same degree of effectiveness.

Coke pointed out that fertilizer is one of the few bargains which farmers can buy today, and that $1.00 so invested will add $2.00 to $10.00 in additional crop production. He pointed out that proper fertilization is a soil conservation practice, for it is well known that the best way to conserve and improve land is to produce luxurient crops year after year. The 100 million dollars spent last year by California farmers for fertilizers and agricultural minerals has been a big factor in California's lead in gross agricultural returns, and in being in the top class among our states in average net returns per farm. He said it also has been a real factor in conserving and improving soils.

He said that institutions that provide financing for agricultural real estate and crop production loans have a real interest in the efficiency of crop production and soil improvement, and their obligation to the farmer is not fulfilled unless he understands the importance of these facts, and is willing to include in the crop loan budget a sufficient sum for those items that make possible an efficient operation, including fertilizers, pesticides, and types of machinery and equipment that reduce the cost of operations.

The ladies enjoyed a special program of entertainment and recreation, including a cocktail hour and luncheon at the Marine Room, La Jolla, following a tour of Scripps Institute of Oceanography. The Association was the sponsor.

Golf tournaments for men and women, bowling, ladies' putting contests, and bridge and canasta were other features. Prizes were awarded at the annual dinner dance, where good food and fellowship prevailed until the early hours.

Sponsors of the major cocktail hours and dinners during the Convention were Stauffer Chemical Company and Western Phosphates, Inc.; Shell Chemical Corporation; Balfour, Guthrie and Company, and American Potash & Chemical Corporation. Atkins, Kroll and Company furnished the printed Convention program.

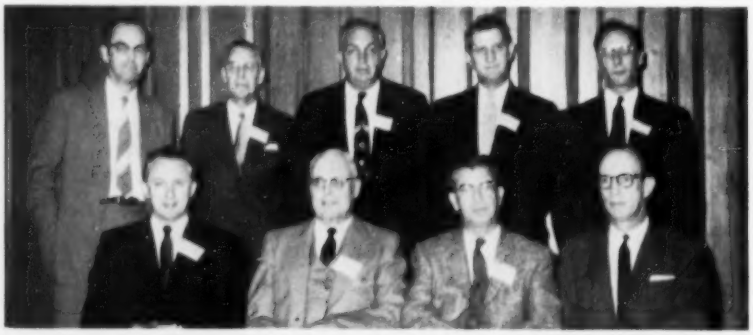
Frank Scoville, Chula Vista, headed the Convention Program Committee; J. T. Garretson, Chula Vista, the Entertainment Committee; and Mrs. J. T. Garretson, the Ladies' Committee.

The site and dates for the 1957 Convention will be chosen by the Board of Directors at its first meeting in 1957.

Institute Honors Two Editors

The Soil Builders Award for Editors was presented to two men for National Plant Food Institute by Louis H. Wilson at the annual meeting of the American Agricultural Editors Association meeting November 28, in Chicago. Frederic B. Knoop, Farm Quarterly, winner in the less-than-300,000 circulation class; Ralph Sandlin Yohe, Prairie Farmer, in the more-than-300,000 class.

OFFICERS AND DIRECTORS OF MIDDLE WEST SOIL IMPROVEMENT COMMITTEE
Seated: L. E. Quiram, Treasurer; R. E. Bennett, President; R. G. Fitzgerald, Vice-President; W. M. Newman, retiring President. Standing: Z. H. Beers, Executive Secretary; G. H. Kingsbury, retiring Treasurer; W. W. Venable, E. T. Potterton and Merle Blue, Directors. (MWSIC directors not shown in picture are: Marshall Smith, J. D. Stewart, Jr., and D. A. Williams).



Pictures made at the recent Middle West Soil Improvement Committee meeting:

1. D. T. Morris and John R. Sargent Federal Chemical Co.
2. C. R. Martin and Chas. F. Martin Miami Fertilizer Co.
3. Wendell Hoover, Jr., and Warren Huff, Ashcraft-Wilkinson Co.
4. Joseph Lanter, Central Farmers Fertilizer Co.
5. H. H. Tucker, Sohio Chemical Co., and A. R. Mullin, Indiana Farm Co-Op. Assn.
6. R. W. Wilson, U. S. Potash Co., and W. B. Copeland, Smith-Douglass Co.
7. E. T. Potterton.
8. H. L. Garrard, American Potash Institute, and Wm. Lehman, Chilean Nitrate Sales Corp.
9. A. C. Norris, V. W. Norris & Son.
10. Earl L. Butz, U. S. Dept. of Agriculture, and W. M. Neuman, Price Chemical Co.
11. R. A. Garn, Farm Bureau Co-Op Assn., and Earl Neuman, Ohio Farmers Grain Co.
12. Russell Pisle, Sohio Chemical Co., George C. Kempson, Monsanto Chemical Co., Geo. W. Cosper, Sohio Chemical Co.
13. A. D. Milburn, Minnesota Farm Bureau Ser. Co., and Leo Orth, Sinclair Chemicals Co.
14. Russell Coleman, National Plant Food Institute, Werner Nelson, American Potash Institute.
15. C. E. Littlejohn, U. S. Potash Co., and Nelson T. White, Smith Agric. Chem. Co.
16. F. N. Calvin, Farmers Union Exchange Co., D. A. Williams, Minn. Farm Bureau Service Co.
17. Howard Kamin and R. T. Corl, Darling & Co., T. E. Bradley, Potash Co. of America.
18. R. D. Taylor, National Potash Co., Cash Cahill, National Potash Co., and Niel McClarnan, St. Regis Paper Co.
19. C. A. Johnson, Land O' Lakes Creameries, Inc., and A. R. Mullin, Ind. Farm Bureau Co-Op. Assn.
20. Z. H. Beers, Geo. A. Barclay and C. E. Trunkey, all of Middle West Soil Improvement Committee.
21. John Sanders, Mississippi River Chemical Co., Cecil H. Fluty, Farm Belt Fertilizer and Chemical Co., C. Ray White, Spencer Chemical Co.
22. Laurie Peterson, Midland Co-Op., Inc., and J. Van Rogers, Southwest Potash Corp.
23. Harold Douthit, International Minerals & Chemical Corp., Pierce Vandercook, George Kingsbury, Kingsbury & Co.
24. R. G. Fitzgerald and R. W. Brun, Smith-Douglass Co., Inc.
25. Dave Van Aken, Spencer Chemical Co., Frank Nelson, Rath Packing Co.
26. John Zigler, International Minerals & Chemical Corp., James L. Schell, Kingsbury & Co.

(These pictures courtesy Middle West Soil Improvement Committee.)

5 PHILLIPS

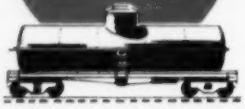
Fertilizer Materials for High Analysis Mixtures

1

AMMONIUM SULFATE

New Premium Quality Phillips *66* Ammonium Sulfate contains 21% nitrogen, 23.8% sulfur. It is *dry*-cured to remove excess moisture, prevent caking. Uniform dust-free crystals flow freely, mix easily. Ideal for all analyses of mixed goods and for direct application. Available in bags or bulk.

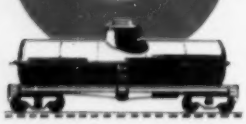
2



ANHYDROUS AMMONIA

Phillips *66* Agricultural Ammonia contains 82% nitrogen. It's a convenient, economical source of nitrogen for formulation of mixed goods. Tank car shipments are assured to Phillips contract customers by Phillips huge production facilities in the Texas Panhandle and at Adams Terminal near Houston.

3



NITROGEN SOLUTIONS

Get more N per dollar! There are three Phillips *66* Nitrogen Solutions for use in preparation of high-analysis fertilizers and the ammoniation of superphosphate. These solutions help to keep manufacturing costs low; help rapid, thorough curing.

4

AMMONIUM NITRATE

Phillips *66* Prilled Ammonium Nitrate contains 33.5% nitrogen. The small, coated prills resist caking, handle easily. Depend on Phillips *66* Prilled Ammonium Nitrate for uniform free-flowing properties and top-notch crop response as a direct application material. It's an ideal companion high nitrogen fertilizer for your quality mixed goods.

5

TRIPLE SUPERPHOSPHATE

Phillips *66* Triple Superphosphate contains 46% available phosphoric acid. Ideal for use in formulation of high-analysis fertilizers.

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CHICAGO, ILL.—7 South Dearborn St.
DENVER, COLO.—1375 Kearney Ave.
DES MOINES, IOWA—606 Hubbell Bldg.
HOUSTON, TEX.—1020 E. Holcombe Blvd.
INDIANAPOLIS, IND.—1112 N. Pennsylvania St.
KANSAS CITY, MO.—500 West 39th St.
MINNEAPOLIS, MINN.—212 Sixth St. South
NEW YORK, N. Y.—80 Broadway
OMAHA, NEB.—WOW Building
PASADENA, CALIF.—330 Security Bldg.
RALEIGH, N. C.—804 St. Mary's St.
SALT LAKE CITY, UTAH—68 South Main St.
SPOKANE, WASH.—521 E. Sprague
ST. LOUIS, MO.—4251 Lindell Blvd.
TAMPA, FLA.—3737 Neptune St.
TULSA, OKLA.—1708 Utica Square
WICHITA, KAN.—501 KFH Building

ARIZONA

Stauffer Chemical has established at Phoenix another of their string of crop chemical plants, which will compound and formulate a range of their products formerly shipped in from the Los Angeles plant.

CALIFORNIA

Best Fertilizers' J. C. O.'Connor has written us to point out that they have had an ammonium phosphate plant for 5 years. The occasion was the statement in our October issue by **T. D. Dunscombe,** in his article on the future of the industry, that "there are only two ammonium phosphate plants in the United States—Pasadena, Texas, and Joplin, Missouri." The Best Fertilizers plant, originally was located in Oakland, their headquarters city, but moved later to a new plant at Lathrop, where they are making pelletized fertilizer in 7 grades: 13-39-0, 19-9-0, 16-20-0, 16-10-0, 10-10-10, 11-8-4 and 15-8-4.

At Lathrop they have also a phosphoric acid plant, along with a sulphuric acid plant which is under construction. They find that water soluble P_2O_5 has a definite advantage in California, and the availability of combined sulphur helps combat the predominately alkaline nature of the soils there.

* * *

Northern California Fertilizer plans a plant, warehouse and offices in a steel structure 80 x 140 feet, at San Jose.

FLORIDA

Florida East Coast Fertilizer was established 33 years ago, and we have just seen copies of their local newspaper, the Homestead Leader-Enterprise, celebrating the event. And it was a real celebration, showing how well FEC stands in their home town . . . something that not all of our plants enjoy, what with fumes and other neighbor-trouble causing matters.

As the paper said, "The 33 history of the Florida East Coast Fertilizer Co. is a story of success carved out by a group of high-minded local men, who refused to be downed by adversity. It is a story, too, that is closely interwoven with the fortunes of the Homestead community, for FEC was organized in the early days of the Florida boom and was destined to share with its farm and grove customers the stern years which followed the boom's end."

At another point in the elaborate and beautifully written pages of text about FEC, the paper made another comment which gives us an inkling of why FEC is not without honor in its own land: "In spite of the hardships of storms, depressions and wars, it seems the early backers held to their belief in the company, and it is these same families that are at the helm of FEC today."

George W. Moody Jr., president now for a dozen years, took over as a director of the company on the death of his father, one of the founders, in 1927 . . . and the other officers are similarly kin to the early settlers who established the concern.

It is interested to note that the original operation was based on a new kind of non-acid-forming fertilizer, because they assumed that the soils in Dade county were acid. It seems to have been some time before soil analysis came to their rescue, and the alkilinity of the local soil was catered to with appropriate grades of fertilizer. After that, things got better.

It was about this time that **Frank Rue,** who died in 1945, came into the picture. And credit is given to Mr. Rue, Mr. Moody and his brother-in-law **A. D. Fogle,** now secretary-treasurer, for the survival of the concern during the bad years. Time after time when financial crisis threatened, the paper reports, these men dug down into their own pockets to save the situation. "The company would not be here today if they had not stood by it so faithfully" they emphasize.

In addition to the officers already mentioned, Mr. Fogle's daughter, **Mrs. Theodore Franklin,** serves as vice-president, with Henry Pridgen as company manager.

* * *

Wilson & Toomer are also people who participate in their hometown affairs wholeheartedly. We note, for example, that in the recent Jacksonville Community Chest drive, they were hosts to one of the report meetings, a luncheon session.

ILLINOIS

H. D. Campbell Co., Rochelle, are now offering Gro-Green liquid fertilizers in a household size squeeze bottle from which the plant food is sprayed directly on the plant leaves after watering. The analysis includes an ingredient which breaks down surface tension, permitting quicker absorption by the leaf surfact. The 4-oz. container retails for 49c.

KANSAS

Homar Agricultural Chemicals Inc., Wichita, has been incorporated to manufacture, process, package and sell all types of chemicals for agricultural purposes with a capital of $80,000. Incorporators: **Phil H. Marvin, Carl F. Hobaugh, Lee R. Meador.**

KENTUCKY

Kentucky Distributors Inc., Paris, is established to make and sell crop chemicals.

MINNESOTA

Welcome Agricultural Chemical Company, Welcome, has established a Campbell plant, with **A. M. Daniels** as manager, and two bulk spreader trucks for service to an area within 50 miles of Campbell. The Welcome concern is owned by A. J. Schuler and his son Frederic, better known in that region as "Fritz," who is a farmer on a large scale.

MISSISSIPPI

Coastal Chemical has awarded contract to **Fluor Corp.** for the erection of the phosphoric acid and granulating units of its multi-million plant at Pascagoula. **Owen Cooper,** who also is executive vice-president of the parent plant at Yazoo City, announces that other units and facilities will be awarded soon. The Fluor contract calls for completion January 1, 1958.

MISSOURI

Consumers Cooperative have consolidated their headquarters from two downtown locations for a new building at 3315 North Oak St., Kansas City, North. The new building contains 63,000 square feet, and cost $1,500,000. It sits on a 16-acre tract, part of which is being kept in its wooded state for recreational purposes.

MONTANA

Anaconda is building a $1,000,000 unit to expand its ammonium phosphate capacity at Anaconda.

NEW YORK

Commercial Solvents and the **Columbia Gas System** have announced a decision to begin engineering and economic studies of a joint project to produce petro-chemicals, which will run to some $50,000,000 and be located in the Ohio Valley area. It has been under investigation for some time, and tentative plans are for construction to begin early next year. Columbia owns substantial reserves of natural gas in the Appalachian area from which hydrocarbons will be extracted. Commercial Solvents will contribute the technical and marketing experience to a proposed jointly owned company.

• • •

International Paper's Bagpak division has established a new office at Camden Ark., with T. A. McCord in charge.

• • •

American Potash & Chemical has subleased additional space at 99 Park Ave., NYC.

• • •

Soil Building International has acquired Aluminum & Chemical Corp., Newport, Ark.

NORTH CAROLINA

Empire Warehouse suffered the third major warehouse fire in five weeks in Greenville. It was in use for storage of fertilizer and tobacco curing equipment. Previously a million dollar fire destroyed a tobacco warehouse. This was followed by destruction of the Dixie Warehouse —a fire which killed two men and threatened the Greenville business district. The State has been asked to investigate suspicions of arson.

OHIO

DuPont's new Fort Hill Works is on the line, producing sulphuric acid as of early last month. It replaces the last of the old chamber process units, the Lockland Works having closed down. Operated by the Grasselli Chemicals department, the new plant is considerably larger than Lockland. Grasselli sulphuric units are also located at Toledo; Ecorse, Mich. and Wurtland, Ky.

• • •

Henry Troyer and Sons are building a new liquid fertilizer manufacturing plant at Plain City, under the engineering guidance of **Ellsworth Equipment & Engineering Company,** Indianapolis. The plant should be ready about the time you read this. It has a capacity of 15 hourly tons, and will use the new salting-out depressants developed by Ellsworth.

• • •

Donald Foster is constructing at Deshler a 60 by 20 foot building as a crop chemical warehouse and process plant. A 22,000 gallon ammonia tank will adjoin the building. The operation is scheduled to be serving the area by Spring.

SOUTH CAROLINA

Swift & Co.'s plant food division plant at Columbia on which more than $100,000 has been spent during the past year, is now being modernized on the outside as well, with a very modern structure of asbestos and fiberglass paneling on steel. A new ramp has made possible the handling of bulk truck loading.

TENNESSEE

Shea Chemical have discovered that their #1 phosphorus furnace is in "remarkably good condition" despite the fact that it has been run without inspection or repair since its start-up in January 1953. Normally furnaces of this type are shut down about every eighteen months for inspection and repair, but by watching the furnace closely throughout the entire period they have found it possible to continue without shutdown. The present inspection, says production vice-president **O. D. Crosby,** confirms the opinion, before the shut-down, that the furnace could continue even longer. They plan in future to operate on longer than normal schedules, as the result of this experience.

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Tennessee Coop. Nashville, have bought 45 acres near Jackson, as site for a new feed and fertilizer plant.

• • •

Valley Hill Chemical is in operation with its mixing plant at Jackson. **A. G. Capps,** general manager, reports they are offering a soil analysis service.

VIRGINIA

Nitrogen Division's new construction at the Hopewell plant, which began in October is scheduled for completion by the end of next summer, they report.

WISCONSIN

Elko Fertilizer, a new concern, is in operation at Elkhorn with a liquid fertilizer plant, capable of 150,000 daily tons, according to **Nathan Eck,** president of the **Elkhorn Chemical Co.,** parent concern.

WYOMING

San Francisco Chemical last month announced a $2,000,000 expansion program at Leefe, using the **Dorr-Oliver** process for a fluo-solids plant, a full scale version of the pilot plant they have been testing. **D. L. King,** president and general manager believes the new operation will do much to continue extraction of phosphates from Western shales on a competitive basis with world market prices and other domestic producers.

AUSTRALIA

Dorr-Oliver has set up a wholly-owned Australian subsidiary which after the first of next month will offer the complete D-O service under the direction of **D. U. Macintosh,** who has been associated with their Australian activities since 1933. The new unit, one of 9 D-O Associated Companies, will be known as **Dorr-Oliver Pty. Ltd.,** and its offices will be Collins House, 360 Collins Street, Melbourne; 39 Pitt Street, Sydney.

CHILE

Anglo-Lautaro Nitrate last month signed an agreement with the Export-Import bank for a $16,000,000 credit to finance their dollar expenditures in their rehabilitation and expansion program. This runs to $25,000,000 total, including construction of a new research laboratory; extension and improvement of the solar evaporation process plant, a process they recently developed; facilities for added by-products; mechanization of the Tocopilla port installations, and further improvement of housing and other living conditions for plant workers.

HOLLAND

N. V. Nederlands Transport Bureau, serving the three big Netherlands producers of nitrogenous fertilizers, due to increasing exports of those products, has found it necessary to increase by a third the present storage and shipping facilities at the Waalhaven, Port of Rotterdam.

IRAQ

Baghdad will be the site of a 300 daily ton sulphur plant planned by the Iraq Development Board; cost will be around $5,600,000.

MEXICO

Explorers Alliance Ltd., Toronto, Canada, are negotiating with the Mexican Government leading to a $33,000,000 fertilizer plant, to be jointly financed with cooperation of Mexican capital. Taking ore from existing Mexican installations, they would develop capacity for 135 daily metric tons of pure zinc; 220 daily tons of sulphuric; 240 daily tons of fertilizer.

Diamond Alkali is conducting what they call "Operation Cooperation" by which Mexican industrial growth is fostered by American management and marketing experience. Three plants in Mexico are getting the benefit of this activity: **Insecticidas y Fertilizantes Diamond del Norte S.A.** at H. Matamoros, Tamps; **Diamond Black Leaf de Mexico S.A. de C.V.,** a sales organization for the manufacturer better known in Mexico as **"Diablamex"; Insecticidas del Pacifico S.A. de C.V.** with an insecticide plant in Sonora.

NEW ZEALAND

W. J. Fraser are building a $2,800,000 superphosphate plant, to be completed during 1958 and to turn out 100,000 annual tons, according to the British concern.

SPAIN

Explosivos' project for a fertilizer plant in Seville, to cost as much as a billion pesos, if our translation is accurate, and to turn out "by the most modern methods — superphosphates, nitrogenous and potassic compounds" is, to quote our source "advancing."

We cannot refrain from quoting from our wide-eyed source the following note: "Although the factory may look now too gigantic, very soon such impression will disappear; the figures of the demand of this indispensable element of agricultural progress will grow enormously with the irrigation works now in course, not only in Andalusia but in Extremadura. Then the fantastic production will be entirely absorbed and even will have to be increased."

VENEZUELA

Lion Oil with four other US concerns has an exploitation concession in Lake Maracaibo. The oil and gas yielding area covers some 2000 acres.

YUGOSLAVIA

Russia is reported to be in construction with a nitrogen fertilizer plant near Belgrade, which should turn out 70,000 annual tons. They are also said to be building in Southeast Serbia a sulphuric acid plant of 120,000 annual tons, feeding a superphosphate operation capable of 250,000 annual tons.

Personals

Alfred J. Dickinson, left, vice president in charge of purchasing since 1952, who has been named assistant to the president of Virginia-Carolina Chemical Corporation, and Douglas W. Laird new manager of the purchasing department which handles all buying for the corporation. Robert R. Martin, not shown, was named as an assistant manager of the purchasing department.

Albert A. Green has moved up to board chairman and his son, **H. Baird Green,** has become president of **Jackson Fertilizer Co.,** Jackson, Miss., as the third generation in a row to head this pioneer concern.

* * *

John R. Spears, who last March became a vice president of **Koppers Co.** gas and coke division has now become in addition general manager of the division, and representative for the entire company's Eastern district.

* * *

Paul N. Simmons has resigned as secretary-manager of **Growers Fertilizer Cooperative,** Lake Alfred, Fla., after nine years service to become vice-president of **M-16 Product Inc.,** it was announced by **George H. Mills,** M-16 board chairman.

* * *

Matt Sylvan, Blencoe, has been elected president of the Iowa **Anhydrous Ammonia Dealers.**

* * *

John F. Donahue has left the Oklahoma State agriculture department to join the research staff of **Chemagro Corp.,** Pittsburgh, Pa.

* * *

Richard O. Rice, New Jersey county agent, has been cited by the **National Association of Agricultural Agents,** and will receive their distinguished service award.

E. Russell Rouzer, former district manager for Miller Chemical and Fertilizer Corporation at Hanover, Pennsylvania, has been named to the post of Technical Supervisor of Liquid Fertilizers. Mr. Rouzer has been with Miller since 1947 and has played an important part in establishing Miller's Hanover plant.

Joseph Adinoff has been promoted to senior development engineer of **American Potash & Chemical Corporation,** according to an announcement by **H. B. H. Cooper,** director of development engineering for the company.

Charles Field has joined AP&C as formulations chemist at the company's Los Angeles plant.

* * *

The American Agricultural Chemical Company has announced the following personnel changes:

J. E. Morgan is production superintendent for the firm's fertilizer plant at London, Ontario, Canada. Formerly he was superintendent of the Port Hope, Ontario plant. **S. J. Thompson** succeeds Mr. Morgan as superintendent at Port Hope.

D. W. Newbauer, formerly assistant superintendent at the Fulton, Ill. plant, is the new production superintendent at Cairo, Ohio.

G. E. Richardson, formerly superintendent at the Columbia, S. C., plant, has been named superintendent at the Charleston, S. C. plant. **C. L. Harris,** formerly assistant superintendent at Pierce, Fla., becomes superintendent at Columbia.

J. D. McMurray has moved from assistant manager of the Carteret, N. J. sales office to the home office fertilizer sales department in New York. **Edgar B. Stalnaker** of Baltimore, Md., is the new assistant sales manager at Carteret.

F. H. Herold has been named chief chemist of the chemical control department laboratory at the East St. Louis, Ill. fertilizer plant. The laboratory also serves plants at Humboldt, La., and Fulton, Ill.

John J. McBride who has joined National Potash Company as traffic Manager, was formerly assistant traffic manager with Mutual Chemical Division of Allied Chemical & Dye Corp. Prior to his eight years with Mutual, he served as traffic assistant for Standard Milling Co.

Not shown is William C. Boswell who has joined National Potash as sales representative in the South.

The Potash Company of America has recently announced the appointment of F. Edward Smith, Jr., as assistant to the vice president in charge of sales. Mr. Smith will headquarter at the General Sales Office of the Potash Company of America, 1625 Eye St., N.W., Washington 6, D. C.

Daniel A. Johnson, Jr., has been elected to succeed **Harold W. Woodruff** as president of **F. H. Woodruff & Sons Inc.,** nationally known lawn and vegetable seed house. Mr. Woodruff, a son of the founder of the 56-year-old company, becomes chairman of the board and will continue to be active in the management of the business.

* * *

Isaac Swisher has been named sales supervisor, direct application materials, in the Illinois district, it has been announced by Nitrogen Division, Allied Chemical and Dye Corporation. The promotion became effective November 1.

Prior to assuming his new position, Mr. Swisher was in charge of Arcadian 12-12-12 sales in the Midwestern area. He has been with Nitrogen Division for three and a half years.

* * *

J. C. Crissey, manager of soil building division, **Cooperative G.L.F. Exchange, Inc.,** announces the appointment of **Michael J. Papai** as assistant director of purchasing. Mr. Papai replaces **Robert B. Lenhart** who resigned from G.L.F. and is now with the **Potash Co. of America. E. H. Phillips,** director of purchasing, who formerly handled the pesticides, will now take over the plant food chemicals and packages as well as miscellaneous farm chamicals.

* * *

Stauffer Chemical Company announces that **George C. Ellis** has been appointed a senior vice-president of the company and general manager of the **West End Chemical Company** division. He has also been elected to Stauffer's board of directors.

Mr. Ellis is one of the pioneers in the field of boron chemicals. He was one of the original organizers of West End Chemical Company and has been an officer and director of that company for the past 26 years. He has served as West End's president since 1943.

At the same time, Stauffer announced that **H. D. Hellmers,** formerly vice-president in charge of production for West End Chemical, has been named division vice-president, production of Stauffer Chemical Company.

D. G. Ellis, since 1953 West End's Sales Manager, has been appointed division vice-president, sales, of Stauffer.

West End Chemical Company was merged into Stauffer Chemical Company on October 1st.

* * *

Promotions and transfers of personnel to keep pace with the expanding demand for agricultural chemicals in the West were announced by **Ralph S. Waltz,** vice president and manager of agricultural chemical sales, **Wilson & Geo. Meyer & Co.,** San Francisco. All changes became effective Nov. 1.

Philip A. Sawyer, of the Los Angeles office staff, has been promoted to assistant manager, agricultural chemical sales, Southwest territory. He will assist **John M. Hooper,** recently transferred from the firm's Portland office.

Richard T. Swanson, Jr., has been transferred from the San Francisco office to the Los Angeles office to take charge of peat moss sales there.

Donald Deggendorf, who until recently was in agricultural chemical and specialty sales work in the Mid-West, has joined the agricultural chemical sales staff in the San Francisco office.

Leland Oberholser, who has been active in sales work, has joined the agricultural chemical sales staff and has been assigned to the Los Angeles office.

Wilson & Geo. Meyer & Co. is Western sales representative for many agricultural and industrial chemical products including **Stauffer Chemical Company** and **Western Phosphates, Inc.,** pohpshate fertilizers; **Norsk Hydro,** Norwegian calcium nitrate and urea; **Western Peat Co. Ltd.,** Canadian peat moss products; and **Eastman Chemical Products, Inc.,** chemicals and plastics. The firm has its headquarters in San Francisco and district offices in Los Angeles, Phoenix, Fresno, Portland, Seattle, Spokane, Salt Lake City, Denver and Omaha.

* * *

Dr. Conrad A. Elvahjem, noted biochemist from Wisconsin University, received the 1956 Charles F. Spencer Award for meritorious contribution to agricultural and food chemistry in Kansas City, November 9. The presentation was made at the Fall Chemical Conference.

Link-Belt Company has announced the following changes in its district office sales organization: Left to right, **Boston**—George A. Most, Jr., has been appointed district manager, from district manager of the Moline, Ill., office. He joined Link-Belt Company in 1937. **Moline**—J. Charles Bullock has been appointed district manager from district manager at Albany, N. Y., since 1948. **Albany**—Gene A. Zwerner has been appointed district manager, from district manager at Washington, D. C.; joined Link-Belt in 1946. **Washington, D. C.**—C. C. Wiley has been appointed district manager from district manager at Baltimore. He started with Link-Belt in 1926. **Baltimore**—Paul Waldorf has been appointed district manager from sales engineer in the Detroit office. He joined the company in 1929.

Southern Nitrogen Company Savannah, Ga., has recently made these appointments—left to right: Robert H. Farrow, director of market research, formerly with Spencer Chemical; Robert Heck, promoted from technical sevice repesentative to director of technical service, formerly with Allied Chemical & Dye at Hopewell; Cliff W. Colliet, sales representative for South Georgia; William "Nat" Henderson, Jr., South Carolina sales representative; James J. Rose, Florida sales representative.

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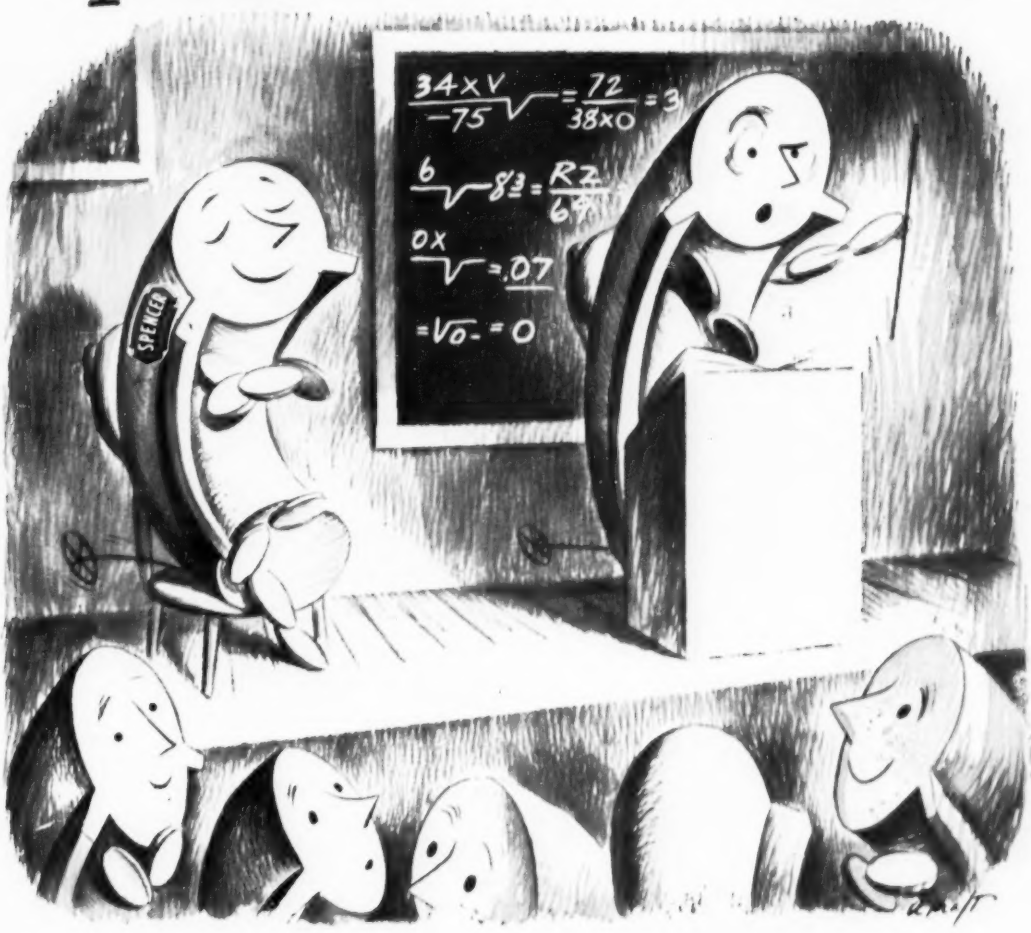

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Alden R. Ludlow Jr. who has been named director of sales for U. S. Industrial Chemicals Co., division of National Distillers Products Corporation, succeeding Lee A. Keane who has retired.

of the Kansas City Section of the American Chemical Society. The Spencer Award was presented by **C. Y. Thomas,** vice president operations of Spencer Chemical Company.

* * *

Robert G. Reed has been appointed business manager of Escambia Chemical Corporation's research division, it was announced by **Dr. N. C. Robertson,** vice president and director of research.

Mr. Reed will be responsible for the business functions and the non-technical administration of Escambia's research department.

* * *

Dr. C. L. W. Swanson of the **Connecticut Agricultural Experiment Station,** New Haven, was elected a Fellow of the **American Society of Agronomy** at their recent annual meeting in Cincinnati, Ohio for his contributions to research in soils. This is the highest honor bestowed on soil scientists by the Society.

Dr. Swanson has been active in investigations on soil fertility and the management of soils for increased crop production. In 1951 he was the recipient of the Stevenson Award of the Society, which includes an honorarium of $500, for his outstanding researches in soils.

The promotion of Richard G. Powell to director of technical services has been announced by John L. Sanders, salesmanager, Mississippi River Chemical Company, a division of Mississippi River Fuel Corp., St. Louis, Mo. He was formerly technical service representative. Mr. Powell will direct the activities of the department in association with Bradley & Baker, distributors of MRC agricultural products.

Kraft Bag Corporation announces the appointment of **Ted Belfit** as sales representative in Pennsylvania, New Jersey and the Metropolitan New York area, taking over duties relinquished by John Wallace as of November 15th.

* * *

W. J. Ehrsam, Jr., president, **J. B. Ehrsam & Sons Manufacturing Co.,** has announced appointment of **Robert K. Yancey** as sales representative in charge of their newly established west coast office at Riverside, Calif. With Ehrsam since 1945 Mr. Yancey has been engaged in both engineering and sales. Other branch offices are located in Kansas City, Kans., Denver, Colo., and Ft. Worth, Texas.

* * *

For **Dr. M. P. Etheredge,** Mississippi State College, 1956 was a year of honors — he received the Herty Award, completed a year as president of Association of American Fertilizer Control Officials, and is the new president of Association of Official Agricultural Chemists.

OBITUARIES

Carl Rice Byers, 69, Armour Fertilizer's chief Carteret agronomist, and with them for 40 years, died November 26 at Westfield, N. J.

Dr. Thomas H. Kearney, 82, honorary curator and research associate with the California Academy of Scientists, and for fifty years with USDA, retiring as chief physiologist, died in San Francisco, October 19.

John Kenneth Payne, 53, president Soil-Aid Corp. Pacific Northwest division, October 22 of a heart attack in Echo, Oregon.

A. V. Phillips, 88, retired director and veteran of 62 years service with Bemis Bro. Bag Company, died November 15 following complications resulting from a fall.

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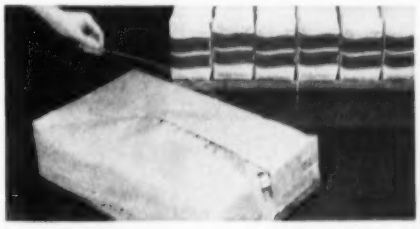

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McCollum Heads Pacific Northwest Association

Ben McCollum, sales manager of the J. R. Simplot Company, Pocatello, Idaho, was elected president of the Pacific Northwest Plant Food Association at its annual convention held at Harrison Hot Springs, British Columbia Nov. 7-8-9th. Frank Taylor, of the Oregon-Washington Fertilizer Co. of Seattle was elected vice-president; Henning Waltersdorph, Magnolia Fertilizer Co., Seattle, treasurer, and Leon S. Jackson of Portland was re-elected secretary. Directors in addition were elected:

Pictures made at the recent Pacific Northwest Plant Food meeting.

1. Grant Graun American Potash Institute, Portland, chairman, Soil Improvement Committee Pacific Northwest Plant Food, Glenn Holt, Pacific Coast Borax Co., Portland, and Dr. E. R. Jackman, Oregon State College, Corvallis.
2. Dr. Russell Coleman, National Plant Food Institute, Washington, and Sid Martin, Valley Spray Co., Yakima.
3. Jack McCorkey and Robert Fulton, Wilson & Geo. Meyer, Seattle.
4. Glenn Holt, Pacific Coast Borax Co., Portland, and Robert Allard, Wilbur Ellis Co., Seattle.
5. Ray Nedig, San Francisco, Hugh Templeton, Portland, both with Balfour, Guthrie & Co.
6. Lee Nicholson, and A. MacDonald, both with Cominco Products Co., Spokane, and E. A. Colls, Consolidated Mining & Smelting Co., Trail, B. C.
7. Leon S. Jackson, Secretary, Pacific Northwest Plant Food Assn., Ben McCollum, new president, Pacific Northwest Plant Food Assn.
8. Henning Waltersdorph, Magnolia Fertilizer Co., Seattle, new treasurer, Pacific Northwest Plant Food Assn., and Harold Rud, J. R. Simplot Co., Salem.
9. Gene Bates, Van Waters & Rogers, Inc., Portland, C. A. Hames, Sherritt Gordon & Co., Ft. Saskatchewan, Alta.
10. F. W. Ayers, Vancouver, Shelby Garwood, Seattle, both with Bemis Bro. Bag Co.

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•
UREA PLANTS
•
AMMONIA OXIDATION UNITS FOR CHAMBER ACID PLANTS
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Robert Allard, Wilbur Ellis & Co., Seattle; Frank Meeker, retiring president, Salem; Karl Baur, Pacific Supply Cooperative, Portland; Norman Hibbert, The Anaconda Company, Yakima, Washington.

The Convention opened with a business session at which the various projects of the association were discussed and the election held. Dr. E. R. Jackman, Oregon State College, explained the "Soil Bank" program, and how it would be of help to fertilizer sales in that area. Dr. Russell Coleman, National Plant Food Institute, showed some films prepared for the fertilizer industry and also the plans of the national organization. The afternoon was left for recreation, with golf and ping pong tournaments. That evening Harrisons & Crosfield staged a cocktail party for the visiting members and friends.

The next day, following a review of the tremendous markets for fertilizer in every state of the country, an interesting forum was held with directors of agriculture from Oregon, Washington and Idaho reciting their problems in the enforcement of the fertilizer laws in the three states.

The annual banquet and distribution of prizes was held that evening with Arthur Laing, member of Parliament of British Columbia as the banquet speaker.

Dorr-Oliver Offers New Pump Bulletin

Dorr-Oliver has announced availability of a new, two-color twenty-page, general bulletin, "Application Engineered," detailing the complete line of Dorr-Oliver pumps available to industry. It describes the distinctive characteristics, materials of construction, types, sizes and capacities of the six major types of Dorr-Oliver pumps for the chemical process and related industries. Also included are photographs and wash and line drawings of the units as well as performance range and power requirement charts.

Applicable primarily to the process industries are the Oliver Type "L" Centrifugal Pump, a corrosion-resistant self-priming chemical pump; the Oliver Diaphragm Slurry Pump, operated by compressed air and using no mechanical linkage to the diaphragm; and the Olivite Acid Handling Pump for corrosive solutions.

Copies of the bulletin are available at no obligation from Dorr-Oliver Incorporated, Barry Place, Stamford, Conn.

Morrow Plots Show Fertilizers Will Revive Worn-Out Soils

A plot of land planted to corn ever since 1876 and receiving no plant food treatment until 1955, produced 113 bushels per acre this year. This high yield was made on one of the famed University of Illinois Morrow plots, the oldest soil experiment plots in America.

The 1956 corn yields show that low yields caused by continuous cropping of corn were due to loss of plant food nutrients and not to the changes in the physical conditions of the soil, M. B. Russell, head of the agronomy department at the University points out.

Changes have taken place in the physical condition of the plots which have been in continuous corn. Organic matter is lower and the soil is harder to work than on plots in a corn-oats-meadow rotation. But Russell says these changes in physical condition have not been a major factor affecting yields when enough plant food has been supplied.

Altogether, four different treatments were used on the corn section of the Morrow plots this year. They were:

1. Continuous corn plot with no treatment since 1876 yielded 29 bushels per acre. 2. Continuous corn with no treatment until 1955, then treated in 1955 and 1956 with lime, nitrogen, phosphate, and potash. This plot yielded 113 bushels per acre. 3. Continuous corn plot with manure-lime-phosphate treatment since 1904 yielded 96 bushels per acre. 4. Continuous corn with manure-lime-phosphate treatment plus extra nitrogen, potash, and phosphate in 1955 and 1956. This plot yielded 128 bushels per acre.

The startling recovery of yields made on the Morrow plots can't be expected on all kinds of soils, say the Illinois agronomists. A soil with good natural physical qualities such as found in central Illinois can be expected to recover much like the Morrow plots. But there are many worn out soils in Illinois that can't be rejuvenated with heavy plant food applications as was done here.

The total amounts of plant food per acre added in 1955 and 1956 to the previously untreated plot were five tons of lime, 400 pounds of nitrogen, 190 pounds of phosphate, and 130 pounds of potash. It is not suggested that these are practical applications. They were designed to completely remove plant food deficiencies.

Record corn yields on the University of Illinois Morrow plots followed the same pattern experienced by many farmers as they harvested their 1956 crop. A. L. Lang and L. B. Miller, members of the committee in charge of the Nation's oldest soil experiment plots had to do some careful piling to get all the corn from the top treated plot in the basket. Yields for the treatments shown from left to right were: none since 1876, 29 bushels per acre; manure-lime-phosphate treatment since 1904, 96 bushels per acre; continuous corn with no treatment 1876 to 1955, then lime, nitrogen, phosphate, and potash 113 bushels; manure-lime-phosphate since 1904 plus nitrogen, phosphate and potash in 1955 and 1956, 128 bushels per acre. (Ill. Agr. Extension Service Photo)

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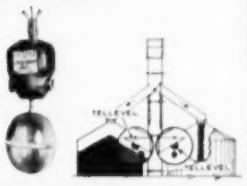

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For complete information on a specific product please write for the bulletin listed under that product. For basic information on the complete line of SA Standard Industrial Products request Bulletin 653A.

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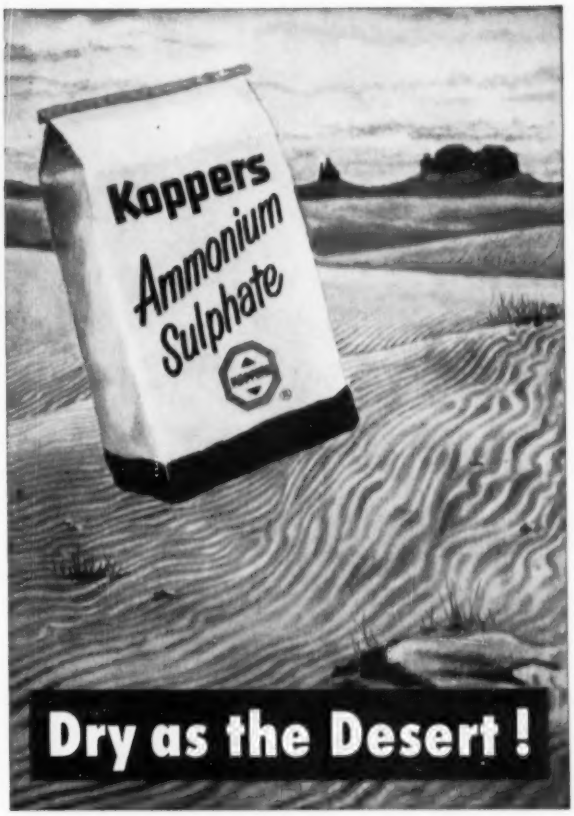

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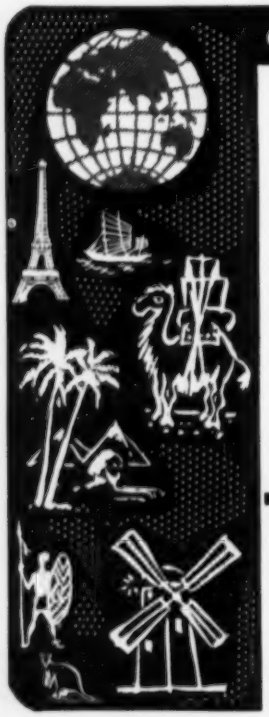

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Georgia Fertilizer Company, Valdosta, recently were awarded a Certificate of Merit for a period of 1,095 days, 467,189 manhours without a lost-time accident—beginning October 9, 1953. The certificate was presented for U. S. Fidelity and Guaranty Company's safety engineering department to Georgia Fertilizer's plant superintendent, William J. Culpepper.

Safety

Perfect safety records for one or more years were reported last month at nine plants of **The American Agricultural Chemical Company.**

Plants with no lost time injuries are at Henderson, N. C.; Spartanburg and Columbia, S. C.; Pierce, Fla.; Chambly, Quebec, Canada; Three Rivers, N. Y.; Norfolk, Va.; Cleveland and Cairo, Ohio.

The Henderson and Spartanburg plants now have completed three successive years without a lost time accident and the Pierce and Chambly plants have two-year records.

• • •

Tenroc Mine owned by the **Coronet Phosphate Company** at Coronet in East Hillsborough County, celebrated its one millionth man hour without a loss-time accident in October.

Gaither Newman, plant personnel and safety director, said the plant has not had a lost-time accident since March 18, 1954. More than 450 employes and their families attended a barbecue and recreation program at the plant's clubhouse in Coronet.

R. S. Rydell, president of Coronet Phosphate Company, came down from the company's home office in Norfolk, Va., for the celebration.

CFA Awards Scholarships

Two students of the Kellogg-Voorhis campus, California State Polytechnic College, Pomona, were given $100.00 scholarship awards for the 1956-57 term by the Soil Improvement Committee of the California Fertilizer Association last month.

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CF Staff-Tabulated TONNAGE REPORTS

FERTILIZER TONNAGE REPORT (in equivalent short tons) Compiled by Cooperating State Control Officials and Tabulated by COMMERCIAL FERTILIZER Staff

	October		September		July-Sept. Qtr.		January-June		July-December		YEAR (July-June)	
STATE	1956	1955	1956	1955	1956	1955	1956	1955	1955	1954	1955-56	1954-55
Alabama	53,799	52,366[1]	35,418	30,213	73,427	62,490	813,104	846,735	167,372	272,068	1,029,030	1,114,238
Arkansas	.....	13,716[1]	13,652	16,586	33,156	33,567	299,172	270,894	60,299	59,997	359,471	330,781
Georgia	31,456	35,346	18,884	13,340	84,808	80,739	993,954	1,047,875	250,968	225,083	1,244,422	1,273,445
Kentucky	.....	34,965[1]	.....	17,130[1]	.....	33,388[1]	441,481	431,024	88,119	91,386	529,600	522,410
Louisiana	25,944	15,019	10,324	12,007	24,150	22,849	214,343	232,781	59,345	78,067	273,688	310,848
Missouri	90,574	115,485	93,613	105,139	177,012	164,002	450,102	414,503	360,210	268,257	804,441	682,690
N. Carolina	.....	74,504[1]	31,272	34,182	67,264	62,174	1,424,267	1,566,158	225,182	264,475	1,649,449	1,830,633
Oklahoma	20,384	23,619	11,824	27,295	25,166	40,347	65,854	63,799	69,542	58,405	135,396	122,204
S. Carolina	31,701	27,987	18,344	18,144	43,019	41,355	743,670	796,111	119,947	132,604	863,617	928,715
Tennessee	38,202	31,494	21,110	21,441	58,205	59,120	378,676	355,966	136,925	167,383	515,551	523,349
Texas	54,882	58,596	32,779	42,850	71,436	76,141	377,805	375,176	188,594	212,885	566,399	588,062
California	(reports compiled quarterly)				181,386	173,411	639,377	603,657	361,615	318,270	1,001,554	922,127
Virginia	(reports compiled quarterly)				75,566	71,064	599,111	636,585	162,709	159,085	761,820	795,770
Indiana	(reports compiled semi-annually)						807,918	873,966	242,530	284,994	1,063,049	1,158,960
Iowa	(reports compiled semi-annually)						231,873[1]	.....	.....	.....	.....	.....
N. Hampshire	(reports compiled semi-annually)						13,168[1]	.....	.....	.....	.....	.....
Washington	(reports compiled semi-annually)						103,288	124,186	48,749	58,162	152,037	182,348
TOTAL	346,942	359,712	287,240	321,197	914,595	887,259	8,352,122	8,639,506	2,542,106	2,651,121	10,949,524	11,286,580

..... (not yet reported) * Not compiled [1] Omitted from column total to allow comparison with some period of current year.

MARKETS

ORGANICS: Movement and demand for fertilizer organics has been active recently, particularly in the Florida area. Prices of Leather Nitrogenous Tankage continue at previous levels of $3.00 to $4.25 per unit of Ammonia f.o.b. production point.

Activated Slude prices continue unchanged at $2.95 per unit of Ammonia and 50c per unit APA, bulk, f.o.b. Midwest production point with another production in the Southwest priced at $3.00 per unit of Nitrogen and 50c per unit of APA, bulk.

CASTOR POMACE: For a short period during the first half of November some Castor Pomace was produced and shipped by domestic producers; however, production is now at a standstill and it is not known when production will resume. Nominal price is $37.50 f.o.b. Northeastern production point, in bags, but it is reported that a limited quantity was sold for January and February shipment at $40.00.

DRIED BLOOD: Prices around $5.00 per unit of Ammonia in the Chicago area for unground sacked blood. The New York market is around $4.25 per unit of Ammonia.

POTASH: Movement against contracts is improving as demand for mixing purposes increases in seasonal dimensions. Prices are unchanged and steady.

GROUND COTTON BUR ASH: Supplies are currently tight for this source of Potash which is primarily in the form of Carbonate of Potash. Further supplies are expected to be available the latter part of December through the balance of the season. Current analyses vary from 35% to 42% K_2O.

SUPERPHOSPHATE: Prices continue steady, but demand for Triple Superphosphate supplies are comfortable and demand tending to increase in seasonal proportions.

PHOSPHATE ROCK: Prices continue firm with stocks comfortable and movement fair.

SULPHATE OF AMMONIA: Prices for domestic shipments continue steady and demand tending slightly upward.

NITRATE OF SODA: Prices continue at previous levels with stocks being built for the expected spring demand.

CALCIUM AMMONIA NITRATE: Prices continue at $51.25 ton in bags, f.o.b. usual Ports and stocks are being built in anticipation of spring demand.

GENERAL: Manufacturing activity, particularly in the Florida area, is quite strong and is expanding in other Southeastern States. The recent outbreak of a waterfront strike affecting the Atlantic and Gulf Ports is disrupting movement of some raw materials to manufacturers in the Southeast but no serious shortage has yet developed. Shortages could easily develop if the strike is prolonged.

INDUSTRY CALENDAR

Date	Organization	Place	City
Dec. 10-12	No. Central Weed	Sherman Hotel	Chicago, Ill.
Dec. 12	Amer. Soc. Ag. Engr.	Edgewater Beach	Chicago, Ill.
		1957	
Jan. 8-9	Texas Fert. Conf.	MSC	
Jan. 23-25	Sou. Weed Conf.	Bon Aire	Augusta, Ga.
Feb. 14-15	Middle West Soil	Edgewater Beach	Chicago, Ill.
June 9-12	NPFI	The Greenbrier	White Sulphur Springs, W. Va.
June 17-19	Sou. Control Officials	Dinkler-Tutwiler	Birmingham, Ala.
July 10-14	Plant Food Producers of Eastern Canada	Manoir Richelieu	Murray Bay
July 17-19	SW Fert. Conf.	Galvez Hotel	Galveston, Texas

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of

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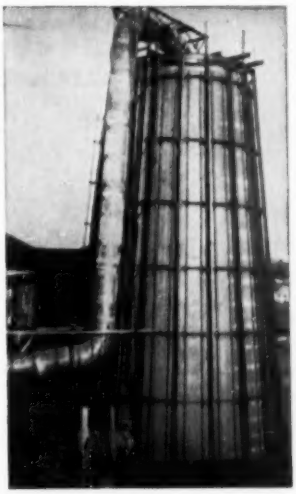

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HERE is an opportunity for one with limited capital to lease a plant or purchase in midwest. Inquire Karr & Co.,—Realtors, 923 E. Broad Street, Columbus 5, Ohio.

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Southern Soil

(Continued from page 48)

resort to soil testing by fields by crops.

To satisfy actual farm needs for fertilizer based on field research and soil tests, industry would need to manufacture and store just three basic P-K ratios with only 2 to 4 grades per group. This is another case of simplification of a problem that is almost out of hand in those states with unlimited registration of grades.

In general the fertilizer industry is following the basic ratio pattern very well, but is greatly overdoing the number of grades per ratio group. Industry, through its dealers and other outlets, is not now supplying the farmer the correct tonnage in each ratio group according to soil test findings. The problem ahead is to adjust our tonnage by ration-grade groups to the needs of our soils and crops.

This heavy-duty fertilizer, lime or phosphate spreader, rugged enough for custom spreading under all conditions, is being manufactured by Adams & Doyle Equipment Manufacturing Co., Quincy, Ill. The manufacturer states it is the only spreader on the market that offers precision built gear cases of hardened steel, with individually cut and spiral matched gears for extra strength, smoother operation and longer life. The 21" bottom plus engineered ratios is claimed to permit an even spread of fertilizers, phosphate or limestone in any amount from 100 pounds to 4 tons per acre. Single or double fan units that can be interchanged in minutes are offered. The fertilizer hood is 20 feet wide with open ends for extra coverage. Hood folds to less than 8 feet for highway travel. Adams & Doyle Spreaders are available in sizes from 7 foot for 3/4 ton pick-up up to 12 foot size for tandem trucks. Specification and price sheets are available from manufacturer.

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INDEX TO ADVERTISERS

Allied Chemical & Dye Corp.,
Nitrogen Div. ..... Front Cover, 19-22
American Agricultural Chemical Company, The 11
American Limestone Co. .....
American Potash & Chemical Corporation .....
Arkell and Smiths 51
Armour Fertilizer Works 66
Ashcraft-Wilkinson Co. ..... 18, Back Cover
Atlanta Utility Works 70

B. I. F. Industries, Omega Machine Company .....
Bagpak Division, International Paper Co. 9
Bemis Bro. Bag Co. 70
Berkshire Chemicals, Inc. 69
Blaw-Knox Company, Blaw-Knox Equipment Division 10
Blue Valley Equip. Mfg. & Engr. Co. .....
Bradley & Baker 24
Burlap Council of Indian Jute Mills Assn. .....

Chase Bag Company .....
Chemical Construction Corporation 63
Chemical Plants Division—Blaw-Knox Company .....
Chicago Fertilizer Company 69
Climax Molybdenum Company 31
Cole Manufacturing Co., R. D. .....
Commercial Solvents Corporation .....

Davidson-Kennedy Co. .....
Davison Chemical Co. Div. W. R. Grace & Co. 17
Dow Chemical Company, The .....
du Pont De Nemours & Co. (Inc.), E. I. 33
Duval Sulphur and Potash Co. 18

Emulsol Chemical Corp. .....
Escambia Chemical Corp. .....
Evans Metal Company .....

Fertilizer Equipment Sales Corporation 70
Fulton Bag & Cotton Mills 61

General American Transportation Corporation 49
Grace Chemical Company Div. W. R. Grace & Co. .....
Grand River Chemical Div. Deere & Co. .....

Hammond Bag & Paper Co., Inc., Div.
Hudson Pulp & Paper Corp. .....
Hough Company, The Frank G. 12-13

International Minerals & Chemical & Corporaiton
Phosphate Chemicals Division 6-7
Phosphate Minerals Division .....
Potash Division .....
International Paper Company 9

Kent Bag Company, Inc., Percy .....
Kopitzke, Fred W. 70
Koppers Company, Inc. (Tar Products Div.) 65
Kraft Bag Corporation ..... Inside Front Cover

Lancaster Allwine & Rommel 70
Law & Company 70
Link-Belt Company 23
Longhorn Construction Co. 69
Lummus Company The .....

Marietta Concrete Corporation The .....
McDermott Bros., Co. .....
McIver & Son Alex. M. 69, 71
Moores Lime Co., The 63

National Lime and Stone Co., The .....
National Potash Company 39
Nitroform Agricultural Chemicals, Inc. 8
Nitrogen Division (Allied Chemical & Dye Corp.) ..... Front Cover, 19-22

Omega Machine Company, B. I. F. Industries .....

Phelps Dodge Refining Corporation 60
Phillips Chemical Company 54
Potash Company of America ..... Inside Back Cover

Quaker Oats Company, The (Chemicals Dept.) 71

Raymond Bag Corporation 15
Refined Products Corporation .....
Renneburg & Sons Co., Edw. 67

Sackett and Sons Co., The A. J. 34-35
St. Regis Paper Company, Multiwall Bag Division .....
Shuey & Co., Inc. 70
Simplicity Engineering Company 16
Sinclair Chemicals, Inc. 3
Smith-Rowland Company .....
Sohio Chemical Company 43
Southern Lead Burning Co. 69
Southern States Phosphate and Fertilizer Co. 71
Southwest Potash Corp. 14
Spencer Chemical Company 59
Stedman Foundry & Machine Company, Inc. 72
Stephens-Adamson Manufacturing Company 65
Lewis J. Stone Co. .....
Sturtevant Mill Company .....

Tennessee Corporation .....
Texas Gulf Sulphur Co. 44
Tull Metal & Supply Co., Inc., J. M. .....

Union Bag-Camp Paper Corporation 41
Union Special Machine Co. .....
U. S. Industrial Chemicals Co., Chemical Div. .....
U. S. Phosphoric Products Division, Tennessee Corp. 24
United States Potash Company,
Div. United States Borax & Chemical Corp. 47

Weatherly Company, The D. M. 4
Wiley & Company, Inc. 70
Willingham-Little Stone Company .....
Woodward & Dickerson, Inc. 66

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